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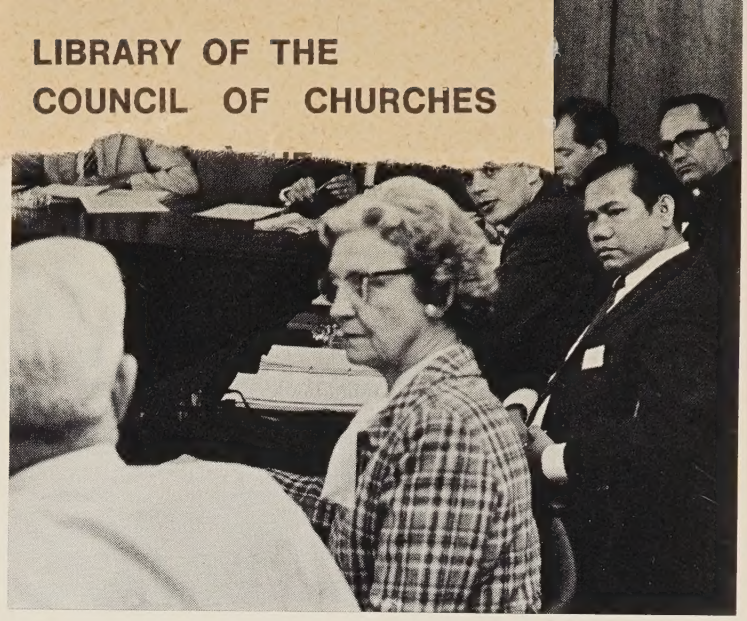

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technology, faith and the future of man

david m. gill

report on an exploratory conference
geneva, june 28 - july 4, 1970

world council of churches
geneva 1970

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Foreword

The growing dialogue between natural scientists, social scientists and ethicists is one of the most encouraging phenomena of our time. An awareness of the problems of the technological revolution generates a mood of anxiety, even despondency. But if this anxiety forces scientists, social thinkers, philosophers, theologians, decision makers and leaders of public opinion to work together to "purify" technological power, there is legitimate ground for optimism. While the conference which is interpreted in these pages generated some heat, some confusion and considerable frustration, the overarching mood was one of hope. Therein lies the rationale and validity for our concern with the future. To be concerned with the future is to be hopeful. If one feels that the end of the world is round the corner one might as well give up the struggle.

David Gill, Secretary in the Department on Church and Society, has earned our gratitude by presenting the content, foci and tenor of the conference with clarity and insight. Perhaps participants might feel somewhat differently about some aspects. That, however, is natural and does not in any way reflect upon the comprehensiveness of the report and the author's integrity in assessment.

Until recently we were perhaps over-enchanted by the possibilities of technological power and almost attributed to it the ability to usher in the millenium — a brave new world flowing with milk and electricity. It was believed that the tremendous productive capacity released by modern science would eradicate want and misery from the face of the earth, and that its potential for destruction would chasten nations into the ways of peace. The balance of terror would strengthen the balance of hope and thus would thistles bear figs ! On the economic front the sentiment was reflected in the high expectations of the first development decade.

But the setbacks and disillusionment of the sixties both in the areas of development and world peace have proved to be a sobering experience. Technology can strengthen the balance of hope only if its unregulated progression is checked. Growth of power must be undergirded by growth of wisdom to use this power ; otherwise technology can go berserk and develop a tyranny that enslaves and dehumanizes people and nations.

When we catalogue the negative effects of modern technology we are pronouncing judgment upon its social framework. That means we question the existing power and property relations and the motivations underlying production and use of resources. If pursuit of individual profit continues as the regulator of production we can scarcely hope to have economic institutions based upon social responsibility. To civilize technological power we have also to change radically our approach to incentives and goals of economic activities in a way that social well-being may condition individual action and international well-being may condition national action. Ob-

viously this calls for new structures reflecting social justice nationally and internationally. Equally obvious is the fact that we do not have such just structures. Therefore, together with technical measures to purge technology of its deleterious elements it is necessary to work with equal concern and commitment for changing the social and political framework.

Production in advanced industrial nations is increasingly built on "managed obsolescence". Such an ideology (for ideology it is) makes a virtue of waste. If we then lament the waste and pollution of technology how can we remedy it by technical measures like inventing less impure technology, without dealing with human attitudes and institutions which have made people believe that the quantum of waste indicates the level of progress? A high consumption society, in some ways, glorifies waste, but the anxiety about environment and ecology which is prevalent in these societies condemns waste. This kind of a contradiction can be resolved only by re-examining values, institutions and socio-economic relationships in these societies. Mere technical measures to have a less harmful technology will not suffice.

Some spokesmen of the Black revolution in the USA are saying that the ruling class and pseudo-liberals of their country are playing up the environment issue to distract attention from the struggle for racial and social justice and peace. Somewhat parallel fears exist in the minds of certain thinkers in developing countries who feel that preoccupation with ecology and population is a clever device to avoid the thorny problems of international inequality and world peace. Maybe these fears are unfounded. But the only way to convince people is to show that the concern for environment and the biological breakthrough are integrally linked up with the ongoing world-wide social revolution.

After all, even if India succeeded in having a zero rate of growth of population tomorrow, the formidable problems of dealing with the needs and aspirations of the present 532 million people would remain. And these problems, it is generally recognized, cannot be dealt with only through technical expedients like more capital, skills and education. They require a radical restructuring of society such that social justice would ensue. Or let us suppose that in developed countries a new technology is evolved which eliminates all the problems of pollution. This will be a significant advance no doubt, but it cannot by itself solve the problems of social and economic injustice, of inequalities between affluent and indigent within and between nations, of ideological tensions leading to warlike conditions, of residues of an outmoded colonial economic structure that make trade, investment and aid instruments of exploitation rather than symbols of partnership, of the unregulated process of transfer of technology which projects the realities of high-consumption societies on to those of scarcity, of military assistance which keeps alive conflict conditions between nations and forces economically weak developing countries to divert resources from the struggle against poverty into military production. The right approach to such problems requires that the technological and social revolutions of our time must act as mutual catalysts, correctives and transformers.

We are often asked what is the Third World viewpoint in this important debate. The approach indicated here represents some elements of our position. It certainly reflects the dominant ecumenical perspective. For the Department on Church and Society, its current future-oriented study programme is a natural and logical extension of its development concerns. Our preoccupation with technology is an attempt to enlarge the understanding of the contemporary social revolution and relate it to the scientific revolution. In any relevant study of man and society the two should be seen as parts of an integral whole. In any event so long as voices from developing nations and disadvantaged groups in developed nations continue to be heard in ecumenical councils there is no danger that the concern for social justice will be pushed to the sidelines.

The term "environment" itself may be differently spelled out. For developed nations the term refers to pollution and ecological imbalances caused by unregulated use of modern technology. We do not possess such technology and are, therefore, relatively free from some of its injurious after-effects. For us the immediate expressions of environmental deficiencies have mainly economic and social forms : poverty, feudal inequality, "domestic imperialism" by entrenched power oligarchies, adverse effects of international economic and political relationships, disease, misery and sub-human living conditions. Thus we consider a structural approach to the problem of "environment purification" absolutely essential.

On the other hand some of the burdens of modernization, industrialization and urbanization experienced by developed nations may not be considered burdens in our situation. To large numbers of deprived people in the rural sectors of Asian, African and Latin American countries urbanization is a process of liberation as it allows escape from the stultifying conditions of a stagnant agricultural sector. Consequently people are willing to put up with urban slums, overcrowding, sub-human conditions of living in cities because there is some hope for progress and equality even in such squalor. This may sound callous, but it is a fact. Of course, the hope for our societies lies not in this doubtful attraction to urban misery but in the new social and political awareness it engenders, thereby strengthening revolutionary forces which will bring about much needed change. It is true that industrialization and urbanization unless these are fitted into a new social framework based upon equality and justice will prove burdensome for us, but we cannot ignore the elements of liberation and social emancipation which they represent.

None of this is intended to minimize the seriousness of the problems of environment and ecology. As in other spheres of activity developing nations should learn from the accumulated experience of the developed nations. For example in labour policy we do not say that we must pass through a stage of heinous exploitation of labour to squeeze savings from the economy as happened in several of today's industrial nations during their early phase of industrialization. On the contrary, many developing nations have adopted progressive labour legislation in line with policies of the ILO, even before the industrial process is underway. This is the right

thing to do. Similar patterns hold true in welfare policies. Moreover since developing nations receive technology in its present form they must be concerned coequally with developed nations in the task of civilizing technology.

Because of the necessity to look at global issues in terms of our own realities the Third World raises questions which may, to the anti-pollution crusader in an industrial society, appear to be of secondary importance. Let me illustrate. We are agreed that technology has to be improved and regulated in order that its potential for human betterment may be actualized. But if technology must be managed why not private international investment, foreign trade and foreign assistance? The fallout of existing patterns of economic relationships between rich and poor nations is proving extremely burdensome to the latter. The same would be true of military involvement of big powers. Even a century of internal strife or communist rule would not have brought the devastation that a few years of American pacification in Vietnam has done. Why is it easily assumed that these are manageable problems when the fact of the matter is that they have been getting worse? Perhaps our ability as a human community to deal with the tortuous problems of ecology, genetical engineering, etc., depends upon our ability and willingness to deal first with what may appear to some as secondary problems. Whether a problem is primary of secondary depends upon who is looking at it.

There are many kinds of poverty. There is the poverty of insufficiency which everyone recognizes but there is also the poverty of affluence which the debate about environment is forcing us to recognize. Should developing nations use narrow economic yardsticks for measuring development, when such yardsticks are under re-examination by affluent nations? The time has come when we in the Third World should evolve a fuller understanding of development in keeping both with our realities as also with the experience of developed nations.

Thus our concerns lead us into new and uncharted areas. Man must not be made subservient to "progress" which is taken as a blessing of modern science. More important than the autonomy of science and technology is the autonomy and freedom of man, of the human spirit. We have to transcend the narrow materialistic concepts that have governed decisions about the use of technological power. The scientist who can see beyond the present level of knowledge, the social scientist who dreams of a new order, the humanist who is concerned about de-humanization of our structures and values, the theologian who struggles to incarnate the transcendental into the existing situation, all of them are engaged in acts of faith. Therein lies our unity as we begin to understand the complexities of society and the exercise of all modes of power : technological, economic, political, in today's world.

Allahabad University S. L. Parmar
November 25, 1970

I. To Find New Paths

The crisis reached cataclysmic proportions twenty five years ago with the blossoming of that mushroom cloud over Hiroshima — a deadly symbol of the widening gap between man's technological competence on the one hand, and his wisdom and ability to direct technology towards humane ends on the other.

What was a gap in 1945 has since grown to become a gulf of truly awesome proportions. Frederick H. Knelman, Chairman of the Department of Humanities of Science at Montreal's Sir George William University, points to the constantly accelerating pace at which science and technology have been extending their power :

> "Whether we select such disparate features as the number of science abstracts, the number of workers in the electronics industry, the number of patents or the number of overseas flights, this accelerated growth rate is such that all areas of science and technology are doubling about once every 10 to 15 years. In effect if applied to the number of scientific workers, 80 per cent of all the scientists who ever lived are alive today. Or we can say that the total amount of knowledge in the areas of science and technology has doubled between 1959 and 1969. Moreover, the rate of commercial exploitation of scientific discoveries is itself accelerating. Little Science has become Big Science, institutionalised and powerful." [1]

Nobody could accuse the churches of having moved too quickly to come to grips with the ethical dilemmas of a technological age. Some scientists have tried to draw the attention of church leaders to these looming dilemmas and a few denominations and ecumenical bodies have devoted short-term attention to particular aspects of the technological crisis.[2] But for the most part, in the great upheaval

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[1] Unless otherwise indicated, all references are to the background papers, speeches, floor interventions or working group reports of the World Council of Churches' Exploratory Conference on "Technology and the Future of Man and Society", held in Geneva from June 28-4 July, 1970. Lists of participants and conference papers are appended.

[2] As recent examples of church-sponsored work which has begun in these areas, see : Cameron P. Hall (ed.), *Human Values and Advancing Technology : A*

which has transformed Christian social ethical thinking during the past few decades, the moral issues stemming from man's increasing power over himself and his environment have gone unheeded.

A Second Ethical Revolution?

Ironically, one reason for the relative neglect of the natural sciences may have been the tremendous stimulus the churches were receiving from developments in the *social* sciences. Economists, sociologists, political scientists and others were helping transform thinking about Christian responsibility in the modern world.

For centuries the churches had taken at face value the words "the poor are with you always" and had interpreted their economic role in terms of charity handouts to those worst hit by this inevitable, unchangeable poverty. But then they began to take seriously the findings of the social sciences. They discovered that the poor need not be with us always, that something could be done to change those structures which give rise to poverty, suffering and human exploitation. And if something could be done, they realized, then Christians should be engaged in trying to do it.

The first major conference of the churches on social questions was sponsored by the Life and Work Movement (one of the World Council of Churches' antecedent bodies) in Stockholm in 1925. Compare that with the WCC's 1966 World Conference on Church and Society, and you see nothing less than a revolution in ecumenical social thought in the space of only four decades. What has happened to Christian ethics as a result of the impact of the social sciences may now be about to be repeated as the churches increasingly take an overdue interest in the ethical issues arising from the natural sciences.

The 1966 World Conference took as its theme "Christians in the Technological and Social Revolutions of our Time". Yet, preoccu-

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New Agenda for the Church in Mission (New York: Friendship Press, 1967); Hans-Ruedi Weber, *Experiments with Man* (Geneva: WCC, 1969); *Man in His Living Environment: An Ethical Assessment* (London: Church Information Office, 1970).

pied with the problems of social, economic and political change, it gave relatively slight attention to Christian responsibility in the face of the current technological revolution. This was highlighted among its unfinished business as an urgent matter for future study.

The WCC's Fourth Assembly, in 1968, showed itself ready to try to fill the gap.[1] "We are faced with the second technological revolution", warned the Assembly's Committee on Church and Society. "Basic human values are at stake. They may be enhanced, stabilized, degraded or destroyed depending on the way we use technology." With this concern, the Assembly urged that the WCC's Department on Church and Society launch a new study programme giving particular attention to science and the problems of world-wide technological change.

This new initiative happened to coincide with an upsurge of confused alarm in many parts of the world. People began to worry in earnest about an impending ecological catastrophe, a population explosion, the threats and promises of biologists, the need for new styles of life and work, the inadequacy of inherited political and economic structures and ideologies, and the threatened subordination of man to the dictates of his machines and computers. Social and technological change was accelerating and seemed out of control. Crisis was being compounded with yet more bewildering crisis. "Future Shock" was how one commentator described it. The optimistic indifference of earlier years was giving way to a corporate loss of nerve, as men started to glimpse the immensity of the challenges arising out of the need to plan responsibly for the future of man and society in a world of science-based technology.

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[1] For at least one of the pioneers of modern ecumenism, the Assembly's interest was fully twenty years overdue. Writing to the World Student Christian Federation in October 1961, J. H. Oldham specified "the lack of a real understanding by the churches of the scientific, technological era that is the great gap which urgently needs to be filled. It has been my conviction from the first formation of the WCC that it should have as one of its major instruments an organ which would promote a genuine dialogue between it and the thought of the 20th century world. But the Ecclesiastical mind as a whole is, as I have already suggested, far too little awake to the significance of the scientific, technological era for us to hope that the promotion of such a dialogue will be regarded as one of the first priorities." (WSCF Archives, Geneva.)

End the Faith-Science Divorce

To some, this all seems a distortion of the traditional interests of "religion". Why should the churches plunge into debates about negative eugenics, non-renewable natural resources, ideological implications of the transfer of technology and the social potentiality of the computer? Has not the WCC a big enough task before it already, without adding to the ecumenical agenda? Should not scientists stick to their lasts and leave it to others to ruminate on the mysteries of religion and ethics?

When it has been alert to its job, the Church has never restricted its interest to any merely "religious" dimension of life. To do so would be to make nonsense of the Incarnation and of a good deal else in the biblical faith as well. As the Second Vatican Council well said, "the joys and the hopes, the griefs and the anxieties of the men of this age, especially those who are poor or in any way afflicted, these too are the joys and hopes, the griefs and anxieties of the followers of Christ".[1] Science and technology, it is becoming increasingly clear, impinge heavily on such human hopes and fears. They raise for our generation some of the most complex ethical issues men have ever had to face. Anything which affects man and his world as profoundly as the technological revolution needs no apology for its inclusion high on the agenda of the Church.

Many scientists, technologists and planners have been aware of this for many years. Some experts, seeing the unprecedented ethical crises towards which their work was leading, yearned for the churches to offer whatever light they could in the shaping of adequate guidelines to give clear direction to this new technology. When biologist René Dubos, of New York's Rockefeller University called recently for "a new social ethic — almost a new social religion", he was expressing the urgency felt by many of his colleagues. When atomic physicist Robert Oppenheimer said that he and his collaborators had known sin, he was implicitly demolishing the wall of separation between the church and the laboratory — a wall which both sides have helped build and which neither now can afford to perpetuate.

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[1] *Pastoral Constitution on the Church in the Modern World* (Gaudium et Spes).

At the same time, scientists were painfully aware that traditional religious thinking was ill-equipped to relate itself creatively to the debate. Gerald Leach voiced the conviction of many biologists, as well as others, when he listed among obstacles to informed public discussion the fact that "the principles which have traditionally formed the basis of such discussion are crumbling. For this reason our former advisers — theologians, philosophers, anthropologists, lawyers and so on — are no longer able to provide the foundations on which a discussion of the ethical problems of medicine should be based — even if they were informed on medical advances." [1]

Small wonder that this first serious venture on the part of the World Council could at best be an *exploratory* conference !

Mechanics of the Conference

In launching the new programme, the Department on Church and Society drew heavily on previous experience, especially that gleaned from its 1966 World Conference.

A broad cross-section of experts was assembled to clarify the issues and propose priorities. A week-long conference was set up for Geneva at the end of June, 1970, to which were invited over one hundred participants from six continents. Their areas of competence were in scientific and technological disciplines, the social sciences, government and industry, community organization, church leadership and theology. Over a third came from Asia, Africa, Latin America and the Middle East. The particular perspectives of rich and poor, reformers and revolutionaries, theorists and social activists, scientists and theologians, were brought into creative tension as the gathering struggled to define the issues which should serve as the central thrust of the new five-year ecumenical inquiry.

The ministry of the laity was sought and accepted. Theologians and church leaders — a minority — took back seats and listened as technologists and planners sketched out the technical and human problems. Towards the end of the meeting a session was devoted

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[1] Gerald LEACH, *The Biocrats* (London : Jonathan Cape, 1970), p. 16.

to the consideration of specifically theological issues. As at the 1966 Conference, some felt that the role of theology was being slighted. Others, however, rejoiced that laymen were being encouraged to make their rightful contribution to the Church's thinking. Most agreed that ethicists and theologians had first to be helped to understand the real questions before they could be expected to produce any very enlightening contribution to the debate from their particular disciplines.

Participants were invited primarily on the basis of the technical competence and ethical insight they had at their command. While the majority belonged to churches in membership with the WCC, eighteen were Roman Catholics, a few had no church allegiance at all and several belonged to other religious traditions. Some of the latter were present because they are engaged in interreligious dialogue in their home situations and their Christian compatriots had urged that they be invited. Yet notwithstanding this wide range of viewpoints, the context for the debate was provided by the tradition of Christian faith and life which constitutes the basis of the World Council.

The gathering had no illusions about its ability to produce instant solutions to dilemmas which are profound, novel and often barely understood. One week in conference can hardly suffice to overcome centuries of indifference, even antagonism, between the Christian faith and the disciplines of science. Hence the labelling of the event an *exploratory* conference, to chart the course ahead for the real work of substance of which it was but the barest beginning.

Chaired by Samuel L. Parmar, who teaches economics at the University of Allahabad and heads the Working Committee of the Department on Church and Society, the conference opened at Geneva's Ecumenical Centre on Sunday, 28th June. Its first days were given over to presentations, panels and debates in plenary. Participants then divided into five working groups, each commissioned to define the issues and priorities for ecumenical study in its particular area of concern. Each group was invited to reflect on its particular theme in the light of the following questions.

"1. What is the shape of the future for man, as projected by .....?

2. How far is the future projection determined by
   (a) strictly predictive scientific methods, extrapolating from present trends ?
   (b) human decisions and the choices made by the planners of that future?
   (c) moral choices made by scientists, technologists, politicians or others?
   (d) Christian faith?
   (e) an ideology or philosophy of history ?

3. How far and in what way does the methodology of ..... raise moral questions in itself when its effect upon the future of man is considered?

4. Given the technological possibilities in ..... and the structure of power that controls them what can man hope for and what must he fear? What is the role of a Christian understanding of God's power and man's nature in discerning this?

5. What is the Church's agenda in the area of .....?"

On the last day, working group reports were subjected to critical scrutiny by the whole conference.

The departmental Working Committee met briefly following the conference, to evaluate the meeting and plan the follow-up. Guided by its discussion and by subsequent correspondence with committee members, Professor Parmar and the staff prepared a report and programme proposals for the WCC Executive Committee. On the basis of these proposals and in the light of the conference explorations, the new five-year study programme on technology, faith and the future of man is now getting under way. Would-be participants in the ecumenical project, or those who want further information about the direction it is taking, should make contact with the Department on Church and Society, World Council of Churches, Geneva.

II. Hopes and Cultures

Opening the conference and welcoming its participants, WCC General Secretary Eugene Carson Blake highlighted three points for consideration : the nature and scope of the revolution in technology and science; its consequences for man and society and the problem of directing it to human ends; and the ethical and theological interpretation of what this means for man and his destiny on earth, particularly from the perspective of Christian faith. Blake went on to contrast the present pessimism about the future with the optimism which had reigned supreme only a few years before, noting that "technical change is coming too fast, our social institutions and systems seem unprepared for the challenge, and our human imagination seems unable to grasp the immensity of the change which is in store for the world".

Seeing Things Whole

Three assumptions underlying the WCC's approach to the new debate were then noted by the World Council's chief executive.

First : people have realized that the Christian faith is not a dogmatic system which shackles the freedom of scientific and technological disciplines. Christian thinking now generally recognizes the relative autonomy of scientific inquiry — relative, because the scientist can never sidestep completely the constraints of his own ideology, culture or ethical assumptions. Yet today scientists seem more aware than ever of the need for moral limits to this freedom of action, and more ready to discuss the immediate and ultimate goals of their work. "The significance of what we are doing here today is very great indeed", said Blake. "It could signal the end of a long and generally sterile conflict between religion and science and open the way to new ways of working together in the interest of human welfare".

Second : the dialogue between the concern about science and the commitment to social justice must be encouraged and deepened.

"It is indicative of the prevailing confusion that so many people, hearing that the World Council's Department on Church and Society would take up this theme, assumed that this meant a retreat from the concern for social justice and social change. The relation between the technologists and the concern for social justice has yet to be clarified. Here again a kind of stand-off sterile battle has been waged which today must be ended if we are to grasp our human responsibility. Those concerned about social justice cannot assume that everything will be all right if only the technology is subservient to social and human ends. That approach begs all the key questions. What is science and technology discovering which threatens or favours human ends ? And what are human ends in a technological era ?"

Third : the search for a truly ecumenical understanding of social responsibility entails challenging the all-too-prevalent parochialism which still shapes the attitudes of many. Citing a well-known American economist, who argues on the basis of the ecological crisis that no substantial improvement in the lives of people in poorer parts of the world will be feasible for at least a generation, Blake hit out at such "one-sided western analyses of population policy and technological growth". One of the goals of the conference, he said, was "to ensure that people with the technical power shall begin to confront those without such power in the battle for a more human future for all mankind".

The "battle" of which Blake had spoken was joined in the opening addresses of Ernst von Weizsäcker, a biologist from Heidelberg, and Kinhide Mushakoji, Director of the Institute of International Relations at Tokyo's Sophia University, as well as in the discussion which they sparked.

Ambivalence in Progress

Speaking on "The Hopes of a Scientific Age", von Weizsäcker traced some of the recent dramatic discoveries within his own discipline. "Almost every dissertation brings to light something quali-

tatively new and in every case could be made the basis for many years of fruitful further research", he said. "Science is beginning to come to grips with the central molecular mechanisms of our human genes and of the body functions and is able to act upon them: first it copies, then it corrects, and finally it constructs." Moreover, increasingly spectacular advances may be anticipated, thanks to the wedding of biology and computer technology.

Yet the results of all research are ambivalent, warned the German scientist. Even when new scientific developments appear dangerous —as for example some aspects of cerebral biochemistry and molecular-genetic manipulation — accelerated work on them remains inevitable. A tragic, false pride underlies the optimism of those who greet new scientific discoveries with an unquestioning belief in progress.

The development of nuclear, biological and chemical weaponry, widespread apathy of the rich in the face of the needs of developing countries, environmental pollution and the prospects of governments or industries manipulating the masses by means of selective information, were among the grounds for apprehension he gave. Some of these loom very close.

> "Bearing in mind that every year millions of people in the Third World die of hunger and diseases creeping in under the shadow of famine and that the working capacity of the living is severely hampered by hunger and disease, and bearing in mind that the industrial countries are almost exclusively responsible for this situation, we see how close we really are already to the silent violence of the B weapons. The aid we fail to give is in many quarters seen as a war-like offensive against the underdeveloped countries".

Von Weizsäcker criticized three common responses to the ambivalence of scientific developments — a frivolous optimistic belief in technological progress, an attitude of political and technological resignation, and a naïve Christian optimism — and called on scientists, politicians and Christians to discover a "fourth way" that would exchange despair for "a constructive shaping of the future".

Alternative Presuppositions and Models

Immediately the conference heard the kind of challenge which was to be repeated, in different forms, in the days that followed — a questioning of western assumptions about technology, civilization, Christianity and "the good life".

Mushakoji, in an address on "Technology and the Cultural Revolution", took issue with the short-circuited logic which equates Christianization with westernization and westernization with modernization, and called for a reconsideration of the real significance of each of these terms. He attacked "technological evolutionism" which sees modernization as "a path smoothly leading to a world where technology will prevail and technology will help man to control nature as well as it will help man to control man".

This model for understanding technology, he argued, is erroneous, in that it is built on the false assumption of the possibility of man acquiring knowledge and power sufficient to control his total environment.

> "By the very nature of models it is impossible to build a model which includes the totality of nature. All models are by nature limited and selective ; they represent just one aspect of the nature which is modelled. Therefore the assumption that we can totally control the environment using a model which itself does not include the totality of the nature is wrong ; by definition it is a mistake and probably this mistake is one of the basic problems we have to face. This is one cause — or perhaps I should say the major cause — for the pollution problem we are now facing."

Another false optimism, went on Mushakoji, is that which assumes a steady shrinkage of the technological gap and a removal of obstacles to the communication of technological information. "Technology is a source of power", he said. "The powerful countries which monopolize certain technologies want to monopolize their technological know-how as long as possible." By way of example, he pointed to Japan's reluctance to share its technological competence with Asian neighbours.

Rejecting the adequacy of the West's approach to science-based technology and declining to join those who want to turn their backs on technology completely, the Japanese political scientist offered two alternatives. The first, the Gandhian principle of *Ahimsa*, opposes the destruction of nature as well as the killing of human beings and insists that man be prepared to live with the other components of nature on nature's own terms. As another Asian participant put it later : man must learn to dance to music he himself did not create. The second, the Chinese Yin-Yang model, accepts man's limited knowledge of the world and envisages co-existence between man, machine and nature.

> "We would not say that we are going to control nature by machine or man by machine, but we would say that in certain aspects of their model, machine will control nature. In other aspects, nature will control machine. In some respects, man will control machine ; in other respects, machine will control man. In this way we will have a more subtle approach which will not be an either/or between the technological approach or the anti-technological approach."

There are several "cultural revolutions" under way at present and one of the most significant — the upheaval which is traumatizing the universities of the West — was given less than adequate attention in the debate which followed. Eleven years ago in a Cambridge University lecture on "The Two Cultures and the Scientific Revolution", C. P. Snow tendered his now well-known interpretation of the growing communication gap between the scientific and literary communities in western society. Snow's thesis has been taken up and reworked by Chancellor William J. McGill of the University of California, San Diego, in a 1970 Commencement Address on the subject "Two Cultures in the American University".

The problem, argues McGill, runs far deeper than mutual incomprehension between groups of intellectuals. It is a cultural division which is felt through the society as a whole and nowhere more deeply than in those barometers of social turbulence, the universities. "The lines of division", he says, "are not literature versus science in the domination of the university, but technological culture versus the culture of alienation and protest". The children of western

technology are repudiating their parentage, in more ways than one, and this is a phenomenon which carries profound implications for the churches.[1]

Whatever the strengths and weaknesses of our particular cultural heritages, the conference seemed to agree, we must find some more adequate framework within which to understand the man/machine/nature relationship. Action on the specific crises of today cannot be deferred until philosophers and theologians have done their homework, however, so the scientists present went on to sketch out the dimensions of some of these specifics.

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[1] One of the best attempts to understand what is happening here is Theodore Roszak's *The Making of a Counter-Culture : Reflections on the Technocratic Society and Its Youthful Opposition* (New York : Doubleday, 1969).

III. The Quality of Human Life - Ecology

"The quality of life", warned the first of the conference working groups, "is presently under grave threat from increasing pressures of population and technology". But what is the nature of this threat? How serious are these pressures? To clarify the facts and sharpen the ethical issues, the conference heard a panel of experts discourse on "Ecological Prospects: The Challenge to a Responsible Use of Natural Resources".

The Dangers

John N. Black, Professor of Forestry and Natural Resources at the University of Edinburgh, led off with a warning about the seriousness of the ecological crisis. The problem, he said, is not merely that we are ruining our environment by the unwise use of natural resources, but rather that man is threatening himself with extinction.

> "If the study of ecology has taught us anything at all, it is that the size of a population is limited by the resources available. A balance is held by a number of feed-back mechanisms which act directly, for instance by starvation or disease, or indirectly, by hormonal changes brought about by crowding, to reduce the rate at which the population reproduces itself. Some — perhaps most — species in their accustomed environment are kept in good balance through their social behavioural patterns, but if for some reason the feed-back mechanisms fail to operate so that the population is allowed to increase out of hand, the destruction of resources by over-exploitation sooner or later precipitates a crash in population numbers. It cannot be taken for granted that the resource system can recover to even a limited rate of production, so that it may be a very long time before the population returns to its previous numbers, if indeed this position is ever reached again."

The general principle applies to *homo sapiens* as much as to other biological species. Yet, emphasized Black, man uniquely has a distinct advantage over his fellow animals in being able to decide for

himself in what ways his population should be controlled, increased or decreased. Questions relating to the urgency and methods of such control were deferred for discussion at a subsequent conference session.

A second but related aspect of the ecological crisis is environmental pollution, which Black described simply as the by-product of bad resource management practices. Pollution has been with us ever since man began attempting to control his environment, but today's greatly accelerated rate of change and our ability to detect and forecast the effects of such change inflate the problem to frightening proportions. What precisely are the causes of the present crisis ?

Black listed two contributing factors : new technical processes introduced without a full understanding of what some of the results may turn out to be, and ecologically destructive practices adopted in the interests of short-term economic gain or administrative expediency. To these another panelist added a third : public ignorance of the ecological facts of life. "Without photosynthesis the biosphere could not exist and yet this seems to be one of the basic factors in life of which the town dwellers of today are completely ignorant", said Michel Batisse, the Secretary General of UNESCO's Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Biosphere.

It was Knelman who put particular emphasis on the fourth contributing factor : technology's inherent tendency to become autonomous and to serve its own ends. Whether for business or government, for socialists or capitalists, the drive towards technological growth is irresistible because of its immediate pay-off in terms of increased power and profit.

> "Technology is running wild. The question of who is master and who is slave as between man and technology is totally unresolved. One of the dominant characteristics of contemporary technology is its relative sovereignty, the fact that it acts as an autonomous system.
>
> We live in a new technological environment where means constantly assume supremacy over ends. The mere possibility assures the application. We are creating a technological civilisation where man may become a slave of techniques."

Hence, concluded Knelman, the pollution problem at base is a problem of politics, economics and human values. What is demanded is some kind of fundamental break, or revolution, in the nature of our economic and political structures so that "this uncontrolled insane growth" might be directed within socially desirable limits towards socially desirable goals.

> "Pollution arises as a backlash, because in the terms of political and economic power we constantly defer the social costs of pollution. The ultimate question now is what system of human values, of goals, of priorities, of choices, of political and economic structures must we create in order to survive — because that is what is involved."

Pollution: All Partaking Together

Is environmental pollution really a *world* problem — or is it a dilemma only for highly industrialized nations? Some Third World participants spoke as if they would be only too pleased to see their cities playing host to increased air and water pollution, if this price would buy the benefits of higher standards of living for their people. Others pointed out that many poorer countries could not afford the luxury of renouncing the use of pollutants : DDT might now be under heavy attack from North Atlantic environmentalists but, as India's Savitri Thapar noted, her country can hardly forget the estimated one hundred million people who suffered from malaria each year before DDT and other public health measures were introduced to counter the disease. That which threatens the quality of life for one part of the world may be deemed necessary to enhance it for another, and it is clear that the issues involved in formulating an acceptable *world* policy for the protection of the environment are complex indeed.

Nevertheless this is not simply an issue for the rich nations. The Third World faces the same environmental dilemmas as the North Atlantic region according to M. T. Zen, an Associate Professor in Geophysics/Vulcanology and Chairman of the Geophysical Laboratory at the Bandung Institute of Technology. He provided an example from his own country.

"About ten off-shore oil drilling rigs are in full operation in Indonesian waters. Daily, large oil tankers cruise the Indonesian seas. Imagine the result if one or more of those oil rigs should go beserk, or if one of those oil tankers goes to the bottom of the sea, spilling oil all over. Being a vulcanologist I frequently visit the volcanic islands of East Indonesia and I am very disturbed to find oil spilled all over the beaches and in the seas. The islands on the east coast of Sumatra have been famous for their fish catches for many years. Now those islands are being deserted because no more fish can be caught."

What is needed, Zen argued, is world-wide action through the U.N. or a similar body to regulate pollution and to encourage the most efficient, practical recovery, processing, use and re-use of raw materials.[1] For the developing countries which yearn for industry he offered one special word of advice : "Industrialization is a must. The natural resources should be developed. But you had better know what you are doing before it is too late."

Just what *are* the poorer countries doing, as they struggle with varying degrees of success to raise their standards of living? Knelman, warning of the long-term prospects for their struggle, put a question mark against those simplistic hopes for world economic development which envisage the poor countries aping the examples of the rich.

"As these countries attempt to approach the rate of industrialization and productivity of the USA they produce the backlash hazards at an ever increasing rate. At present the USA with 200 million people uses 40% of the world's non-renewable resources and produces almost half the world's automobile population. If the billion people of the USSR and China were to achieve this level of industrialization, the multiplication of conflict and technological backlash would be extremely high. And yet we in the West cannot make this pious demand to the developing or Third World if we are not prepared for sacrifice. The total production of the

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[1] An event which will bear watching by the churches and other concerned groups is the planned 1972 U.N. Conference on the Human Environment. Its goal is to focus the attention of governments and public opinion on the urgency of environmental problems and on possible international action to cope with them.

world's non-renewable resources would have to be more than doubled. The input of thermal and radioactive waste alone into the biosphere would threaten life on the planet."

The issue becomes, therefore : how can the highly industrialized countries be saved from their own industry, and what can the developing countries do to advance the quality of life for their people without repeating the mistakes of the West? This calls for drastic new thinking on all sides. Perhaps the "have" nations must cease dreaming of endlessly rising standards of living and start working instead for what will constitute, in the light of the dual imperatives of world-scale economic justice and ecological sanity, a *reasonable* standard of living. It may even, some suggest, entail "de-development" by the affluent nations to a lower level of resource consumption.

At any rate, the basic assumptions on which existing economic patterns have developed now stand challenged. Efforts to redirect them may entail serious social conflict ; ecological stabilization may demand nothing less than — in one form or another — economic revolution.

More of Less

Pollution, however, was not the only aspect of the environment crisis to which the Church was asked to pay attention. It was Black who warned of the loss of ecological diversity through a reduction in the naturally occurring range of species and the extinction of species from the earth.

> "Simplification of the environment by reducing the range of species present is a consequence — probably an inevitable consequence — of developing natural resources for the benefit of man. Anything which competes with man for a share in the products of the resources system is ruthlessly eliminated — weeds, animals predating on domestic stock, organisms causing human disease. Mixed woodlands and forests with their wide range of trees and ground flora, are replaced by monocultures of farm crops or plantations of one species of tree. Natural pastures having a great diversity of species give way to ultra-simple

pasture swards of two or three plants only. Hedges are removed in the interests of mechanized agriculture. Herds of well-adapted wild ungulates are replaced by non-indigenous domestic stock which are less likely to thrive. The end result of intensive resource management is always, I think, the same : many species give way to few."

Why, in the final analysis, should we fight to preserve species from extinction ? Black listed some possible answers to this question : the aesthetic (that they are beautiful), the ethical (that they have a right to live) and the scientific (that they are sources of genetic material or confer ecological stability). Beyond all of these reasons people give, however, there seems to be an unarticulated faith that somehow a wide range of species is desirable and ought to be preserved.

But a vague unarticulated faith is hardly sufficient defense against all the pressures working towards ecological simplification. Charles Birch, who heads the School of Biological Sciences at the University of Sydney, pointed up the inadequacy of "usefulness to man" as a criterion for conservation.

"In Australia for example we have the problem of the conservation of the kangaroo. We have several dozen species and it is very difficult to argue for keeping more than a couple of them, when they compete with sheep and particularly when their main usefulness is to boost the tourist trade. Americans especially like to see kangaroos, but they'd be satisfied with one species. A number of species have already been shot out... We need an ecological ethic, an attitude toward nature which goes beyond mere usefulness. Otherwise, conservation is a lost cause. Here the Church can do something tremendously significant if it has something to say which will cut ice."

Panic Stations ?

The issues are urgent. The stakes, ultimately, are the survival of man on this earth. Does this mean that the Church should clamber aboard the bandwaggon which is now rolling in some parts of the

world and begin shouting about the ecological end of the world being at hand? Should it pronounce immediately its *nihil obstat* upon the gloomy predictions of such scientists as the American Paul Ehrlich, who has forecast the death of the oceans for 1979?

While conference participants enthusiastically welcomed the overdue public concern being generated by the Ehrlichs of this world, the majority were not yet ready to crusade for a particular programme promising ecological salvation. Batisse expressed a scientist's scepticism about some of the furore being fostered in the mass media.

> "Some of the impending catastrophes we hear about are only based on figures, repeated from one newspaper to another, which have no great scientific value insofar as accuracy is concerned. No real systematic observing or monitoring of the changes which have taken place in the biosphere, or at least of the most important variables concerned, has in fact been done."

The Church has had an unfortunate tendency to launch moral crusades before taking the trouble to get its facts straight, and clearly at the present time ecologists are not agreed on the urgency of particular aspects of the current crisis or on the solutions which might be effective in countering it. Issues are being clarified; solutions are being evaluated. Meanwhile the Church can and must turn its thinking to the challenges ecology raises for faith and ethics. Some useful hints for this process of reflection appeared in the working group's report.

> "What is man's environment — does it not include non-material attributes? What is the relationship between man and the natural world and how do scientific and theological attitudes to this problem relate? How can man adapt to a changing world and what types of values — theological, religious or cultural — help him to survive the effects of those changes? Should we not have an open vision of the world and the universe to which we can aspire? What is the prospect of the end of the world and what is the significance of death, from both theological and scientific viewpoints? Upon what basis can technological innovations be assessed insofar as they affect the quality of life? What is our relationship and our responsibility to the future of mankind?"

There can be no universal definition of "the quality of life", which varies according to regional, cultural and political as well as technological factors. Has the Church something useful to contribute to the debate about what, in different situations, such "quality" might entail and how it might be secured? The working group certainly thought so and urged the WCC to focus its efforts at this point. It also called for new ways of looking at the man/nature relationship.

> "The future of man and the earth as man's natural environment are inextricably bound together and cannot be considered separately. Man and the earth have a common history; such an holistic vision is needed if we are to face the challenges of the future."

It was Black, a scientist who stands outside the institutional Church, who emphasized most strongly the relevance of theological reflection to the contemporary crisis. Many of our ecological dilemmas defy analysis solely in terms of scientific or economic criteria. Western culture has stressed man's right to dominion over the rest of nature so that it is scarcely surprising that we should find ourselves now so hypnotized by material development as to have been blinded to the deterioration of our environment. What is needed, argued Black, is a countervailing concept of responsibility for our use of the earth — and science as science cannot produce an answer to the problems of responsibility.

> "All western sciences depend heavily on western religious and philosophic concepts, but ecology more so than other disciplines, because the really important questions are not to be answered on technical grounds alone. They depend for their solution on such matters as the acceptable quality of the environment, the integrity of nature, the value of the individual and our relationship to posterity. It is in forming our attitude to these problems that this Council has so natural and so vital a role to play."

IV. The Quantity of Human Life - Population

If environmental pollution and ecological simplification endanger the quality of life on this planet, the threat they represent appears to be magnified many times over by the numerical proliferation in which *homo sapiens* is at present indulging himself. Said the first working group :

> "While technology may increase the fullness of the life man may lead, it does not always do so, either because it may not have been adequately developed or has been developed in the wrong way, causing frustration in those excluded from the expected benefits, or because those benefits are offset by continuing increases in the rate of population growth. Even were populations static, increased development would bring its problems, but these are compounded when technical "progress" and increasing population march hand in hand."

The usual statistic projects a doubling of the earth's population in about thirty years, from the present 3.5 billion to something like seven billion. A further doubling to fifteen billion can be expected, in the opinion of many demographers, by 2025, and yet another will bring us to thirty billion by 2050. A large proportion of our present 3.5 billion neighbours are undernourished and thousands die daily of starvation. The prospect of having, less than a century hence, nearly ten bodies for every one there is today, with the multiplication of human misery and the plummeting quality of life such crowding would entail, ensured particular interest in the panel debating "World Population Growth : Its Social, Economic and Ethical Implications".

Theodore K. Ruprecht, Professor of Economics at Humboldt State College in California, provided a picture of national and regional contrasts within the planetary pattern of rapid population growth. Relatively low rates in economically developed countries (for most, currently less than one per cent per year) contrast with the faster growth of their poorer neighbours.

> "As a group, the underdeveloped countries are currently growing at a rate approximating 2.2 per cent per year. Within this average, however, there are rather substantial variances in rates. For

example, the estimated annual percentage growth rate for Mozambique is 1.2, Burma 2.2, Nigeria 2.5, Brazil 2.8, El Salvador 3.3 and the Philippines 3.5. In addition, rather considerable differences are observed in the factors determining these rates. Fertility and mortality rates are the chief determinants of the rate of growth of population except in those rather special cases in which international migration constitutes an important third variable. The underdeveloped countries evidence substantial differences in the level and trend of these vital rates. The range is from conditions of high fertility and high mortality such as in Dahomey (with a birth rate of 54 births per year per 1000 population and a death rate estimated between 26 and 31 deaths per year per 1000 population), through conditions of high fertility and falling mortality such as in the Dominican Republic (49 and 15), and high fertility and low mortality such as in Paraguay (45 and 11), to falling fertility and low mortality such as in Taiwan (29 and 6) and Singapore (27 and 5)."

What do such statistics mean for the quality of life in regions where the growth rate is high? Samuel K. Gaisie, of the University of Ghana's Demographic Unit, spoke of the prospects for Africa, which must brace itself for a likely 122 % increase by the end of the century. High birth rates and declining mortality mean more non productive mouths to feed, as the proportions increase of people aged less than fifteen years and more than sixty-five years. Already in 1961 Ghana saw its reserve for food farming in the forest regions shrinking by two hundred square miles annually, and the millions it had to spend on food imports equalled its total trade deficit for the year. Moreover, the percentage of national income having to be set aside for education, health, vocational training and other such "unproductive" social services will soar.

"The issue is not how many people the country can accommodate but rather at what level are they going to live. Moreover, a decline in fertility does not mean that the population will stop growing, but simply a reduction of population growth will facilitate the process of technological modernization. The country may decide to have a much larger population but this objective should be achieved without inflicting undue hardships on the people."

Beware of Oversimplification

The relationship between population trends and the quality of life is oversimplified and hence misunderstood in a great deal of the popular debate, argued Ruprecht.

> "Predictions of impending famine due to land scarcity have been a stock argument of the population crisis adherents. Their predictions have not been realized because their assumption of a relatively inflexible extensive land margin and/or a relatively fixed agricultural technology have not been fulfilled. The application of man's existing knowledge to the problems of land supply augmentation and increases in crop yields through multiple cropping, irrigation, improved seeds, more productive crop mixes, effective pest and disease control and improved soil fertility, would appear to be sufficient to assure adequate food supplies for a considerable period of time. The ability, however, of the social and cultural factors to accommodate the changes required for the application of this knowledge remains a main current question mark. This problem is a population problem only to the extent that rapid rates of population increase or greater population densities make the transition to new behaviour patterns more difficult. If they in fact do so in the area of agricultural technology is currently a debatable question."

Furthermore, environmentalists in the developed countries who press for a zero rate of population and economic growth in order to control pollution are fighting the wrong battle. It is simply naive to say, as for example does Paul Ehrlich, that "too many cars, too many factories, too much detergent, too much pesticide, multiplying contrails, inadequate sewage treatment plants, too little water, too much carbon dioxide — all can be traced easily to *too many people*".[1] Not at all, said Ruprecht. The root cause of environmental deterioration is neither too many people nor too much economic growth but rather "external diseconomies" — production costs borne externally by society rather than internally by the producer.

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[1] Paul R. Ehrlich, *The Population Bomb* (New York : Ballantine, 1968), pp. 66-67.

"The polluter of a stream does not bear the cost which the pollution imposes on those who wish to fish the stream, swim in it, picnic along it, or drink its water. Since the compensating costs, monetary or psychic, which are thus incurred by society are not borne by the producer, they are not reflected in the cost and price of the output. The result is that the price mechanism does not perform its full economizing function. That is to say, that since pollution is not fully costed, the process of economizing increasingly costly elements in production is not activated. What is desired is to convert the external diseconomies into internal costs through, for example, a system of proportionate effluency fees. The result would be to cause the producer to economize on his pollution, and most importantly, to develop production technology which is more pollution and, therefore, cost free. The importance of this latter point is that it brings technological development to bear on the problem and extends the limits of the environmental margin to economic processes. The environmental pollution margin is much more sensitive to manipulation in this manner than through a slow-down in economic and population growth with given behavioural patterns. The conception of the pollution problem in terms of external diseconomies leads to solutions which emphasize maximum welfare at lowest consumption and maximized recycling and lead to the real goal of zero environmental deterioration."

Notwithstanding such reservations about the scientific validity of some arguments advanced by advocates of zero population growth, Ruprecht concurred with the need to curtail man's current reproductive spree. For one thing, we do not know how long present reserves of depletable natural resources will last and it is difficult to anticipate technology's potential for improving efficiency in the use and recycling of such resources. For another, population growth has its own inherent momentum and the full effects of changes in vital rates take long periods to work themselves out. Further, increased numbers simply add to the already almost overwhelming problems of the poorer countries by inhibiting their attempts to make more effective use of resources. Environmental space and diversity, which both appear to be necessary for the healthy survival

of man, also are diminished by population growth and therefore constitute additional reasons for trying to cut back human reproduction.

Some Third World Perspectives

Ruprecht was not the only speaker to take a rather sceptical view of aspects of the North Atlantic's current "population explosion" panic. When public opinion in the wealthy countries clamours for population control, usually meaning that "they" over "there" in Asia, Africa and Latin America should do something drastic to curtail "their" reproduction rates — and when that same public opinion remains studiously unresponsive to Third World demands for world economic justice — and when those same wealthy countries are themselves wreaking disproportionate ecological havoc upon the planet — then the rich nations should hardly be surprised when their poorer neighbours look upon their birth control crusades with somewhat jaundiced eyes.

It was the Latin American panelist who laid greatest stress on the fact that lessened population growth rates, while desirable, are no cure-all for the problems of poverty, hunger, disease and exploitation. Population is only one among several variables inhibiting the establishment of better living conditions in the poorer countries, pointed out Rodrigo Gutiérrez, Dean of the Faculty of Medicine at the University of Costa Rica. He cited land tenure systems, foreign economic domination, difficulties of international marketing, corrupt or oppressive government and the flight of qualified personnel to jobs overseas as other aspects of the problem. A grim picture was given of the socio-economic situation in most parts of Latin America.

> "Two-thirds of the population is undernourished ; in most of the countries, illiteracy varies from 40 to 70 per cent. There are only two countries whose illiteracy rate is below 10% of the total population. Two-thirds of the population does not receive medical attention. Migration from rural areas toward cities is very heavy (46% of the Latin American population lives in urban zones and 25% of the overall urban population lives in cities of more than one million inhabitants). 5% of the population

absorbs 24% of all of the goods consumed in the area : 45% absorbs 60% of total consumption, and the remaining 50% of the population — the lowest income group — consumes the remaining 16% of total personal consumption... Further, according to CEPAL studies, during the seven years from 1955 through 1961 only, the group of Latin American countries has lost more than US$ 10,000,000,000 due to price differences (they raise the price of the things they sell us and lower the price of the products we sell them). The Latin American countries received, from assistance and loans of all kinds, the sum of US$ 6,811,000,000 but not over the same seven-year period but from 1945-1962 — that is over a period of 17 years. This means that, even though foreign aid were doubled, if things continue along this same road to deterioration and at the same rate, there will be no amount of foreign resources capable of restoring balance, particularly considering that Latin American economy is based on the exportation of agricultural products and on the operation, by foreign powers, of extractive raw materials (ore, oil, timber, etc.) which are depletable. What fate is in store for Latin America when all of its wealth has been depleted, if it has not achieved full industrial development?"

Thus, said Gutiérrez, Latin American countries now face a critical, threefold task. They must (a) adjust their political and economic structures to facilitate development; (b) intervene in the variables that determine the crisis in order to change them in such a way that they will facilitate development; and (c) define, within their own cultural framework, the development goals they want to reach. Population growth becomes therefore only one among several variables which must be understood and tackled together.

"There is nothing magic about family planning", agreed Carl Wahren. "As the late Prime Minister Nehru said a few years ago, family planning cannot solve all the problems of development but without family planning the problems of development will not be solved." Pleading for a genuinely international perspective on population issues, the Head of the Population and Family Welfare Division of the Swedish International Development Authority hit out at "very old fashioned nationalistic ideas" which exacerbate rather than ease the problem.

"I find it appalling and tragic that we use today two sets of standards in the world. Some western countries have extremely pronatalist policies and do everything possible to increase their numbers of children. Why? — because they need more labour. At the same time, other countries with hundreds of millions of people have plentiful labour, even if most of it is unskilled, and lots of children who are a potential labour force. But immigration policies are extremely biased. Those countries which most energetically stimulate their own birth rates and encourage immigration are the ones with the strictest rules against certain forms of immigration."

Biased immigration policies are not the only respect in which white racism complicates matters. The Rhodesian regime, for example, assiduously canvasses Europe for potential immigrants of Caucasian extraction — while at the same time doing its best to lower the birth rate of its own Black populace. While we may not be convinced, we certainly should not be surprised that for a large number of the world's exploited people "population control" sounds like a new and more sophisticated term for "genocide".

Anthropologist Margaret Mead, while pressing for immediate action to slow the birth rate, managed to discern at least one reason for satisfaction in the midst of a generally unsatisfactory situation. Just as urbanization gradually has emancipated many men from their captivity to subsistence-level toil, so the population explosion promises a similar freedom for women, Dr. Mead argued.

"It will no longer be necessary that all women devote their entire lives to producing a large number of children most of whom will die. Instead, they can produce a small number of children who will be properly cared for. As the agricultural revolution freed men to become priests and prophets, poets and dreamers, scientists and technicians, industrialists and statesmen, so the population explosion may be expected to free women in the same way."

Assessing the Urgency

If the population issue is only one aspect of the struggle for social and economic development, panelists were asked, then what

kind of priority does it have among the other variables ? Can it be shelved for the time being while more immediate crises are disposed of?

It cannot, replied Ruprecht, warning against the temptation to "lexicographic ordering" — the assumption that we must first solve one problem before we begin work on a second, which in turn must be solved before any attention can be paid to a third. Instead, what is needed is a "marginal" style of operation which makes adjustments at as many points as possible in the overall process. This entails recognizing the interdependencies between population growth and other determinants of economic and social development and avoiding the extremism of those who say, on the one hand, that population has clear priority over all other problems or, on the other, that population is not a significant factor and should therefore be ignored.

How can such a reduction in birth rates be achieved? It may be highly desirable from the point of view of a particular society as a whole that its fertility should decline, but at the level of individual families — which after all is the point at which population policies succeed or fail — the arguments of economists and demographers may not be persuasive at all. For such a society, government intervention in some form, to induce socially desirable fertility rates, perhaps through economic incentives, would appear to be the only workable solution.

Savitri Thapar, a Senior Research Officer in Demography at the London School of Economics, described by way of a case study the tribulations of the government of India, now responsible for a population of about 550 million and having to cope with an estimated increase of 14-15 million every year.

> "In popularizing family planning we cannot have any direct carry over of ideas or principles from the Western countries, as the circumstances under which the reduction in family size took place in the West are not likely to be obtained soon in India. So it will have to be a novel experiment of bringing about a change in the social outlook and traditional beliefs of the people, that may make a small family desirable, before a good deal of urbanization,

an appreciable rise in income, or a reasonable advance in the standard of education takes place in the country. The task in India would be very big, as social change leading to an appreciable reduction in family size in the West, and in Japan, came as a by-product of urban industrial development (though with a varying time lag). Whereas up to now the urbanization and industrialization which have taken place in India have not resulted in a fertility any significantly lower than in the rural areas. So far the small family pattern and the practice of family limitation have been adopted only by relatively few highly educated people with high socio-economic status, with the inevitable result that no differential fertility is noticed between the various socio-economic groups or among the urban and rural areas in the country."

What has to be done, she said, is not only the teaching of birth control techniques. More important is the question of motivation : there must be more effective family planning education to change the social outlook of couples so that they will desire small families of two or three children. Such programmes cannot hope to solve the problem of hunger and over-population, but they can provide a breathing space for the implementation of economic development plans. "Widespread birth control seems to be the best short- and middle-term method of at least ensuring a continuation of a subsistence diet for the present population of India and other countries in similar situations", concluded Dr. Thapar.

If reliance is placed on governments persuading people voluntarily to limit family size, the ethical controversies surrounding contraception, abortion and sterilization cannot be avoided. More complex ethical issues arise, however, if we consider the arguments of those demographers who doubt that "persuasion" can bring the needed results and who press for more drastic forms of government intervention — such as the introduction of infertility drugs into food and water supplies.

In this discussion of viable policy alternatives, moral considerations obviously have an important place. However, warned Ruprecht, "the force of that place is negatively correlated with the extent of the crisis atmosphere which exists at the time. The latter, of course, is closely related to the procrastination coefficient !"

Admittedly a crisis atmosphere may not commend itself to those who have to try to reflect on such problems with some degree of academic calm and objectivity. It may, on the other hand, be not only appropriate but desirable, if a crisis has become sufficiently threatening to require drastic corrective action.

Some observers felt that the conference debate would have benefited from a little more of this sense of urgency. Perhaps some parts of the world do require much larger populations if they are to make the most of their resources ; maybe we cannot be sure of the point at which it is most desirable that the planet's human proliferation should be stabilized ; granted there are complex problems here on which the experts have not yet reached consensus. But the fact remains that we face the prospect of unprecedented human cataclysm unless, in the relatively near future, man calls a halt to his reproductive spree. Experience to date in trying to lower population growth rates is hardly encouraging for those who are looking for alternatives to Armageddon.

The greatest barrier to responsible action on the population problem is neither hysteria nor apathy, but the massive human propensity for indifference to the suffering of the neighbour. Gutiérrez saw this in terms of a wealthy minority so mesmerized by its own technological achievements as to be unable to spare a thought for the quality of life of the great majority of its fellow travellers aboard Spaceship Earth.

> "To define development goals is a task for Latin Americans and for the human race. It will seem like a silly thought, to the illustrious members of this conference, if I say that man, the human being, will have to turn his gaze to the simple and fundamental things of his existence : shelter, food, clothing, education for living, recreation. It is quite possible that an aspiration as simple as that — which to me is so fundamental and important — may find no room in the modern society of the rich nations, that chase after the glory of space conquest and the complicated comfort created for the minorities by their economy of consumption. Man — I believe — must find once again his own fate : the gratifying of the basic and fundamental needs of his existence. This should be his only task for the rest of the Twentieth century."

V. The Purpose of Human Life - Biology

A quarter of a century ago, a series of atomic blasts pointed to physics as the scientific discipline raising the most acute questions about man's use of technology. Now, however, the biological sciences are framing equally important ethical dilemmas. Can we find guidelines to resolve these dilemmas in time, or will mankind once again, as at Hiroshima and Nagasaki, be taken by surprise by its own inventions?

But what precisely are these dilemmas? An expert panel was asked to lead the conference into "Human Implications of Discoveries in the Biological Sciences".

Genetics: Problems and Possibilities

First among the specific issues listed for attention was the shaping of man's genetical future. Conference participants had before them a background paper on "Human Evolution and Ethical Issues", by Theodosius Dobzhansky of New York's Rockefeller University. It illustrated the problem with some startling statistics: some years ago it was discovered that in Northern Ireland at least 4% of newborn children carried genetic defects which would incapacitate them more or less seriously at some time during their lives and about 26% of hospital beds were occupied by people with genetically caused defects. Add to this the proportion of genetically-sparked abortions and stillbirths, magnify to a world scale, and you have a picture of a great deal of human misery.

Moreover the burden of genetic defects is growing heavier with each passing generation. Natural selection, which in the past defended the genetic health of *homo sapiens*, is being frustrated by modern medicine and technology. Genetic weaklings who in previous centuries would have been weeded out now survive, reproduce and pass on their accumulating inferior genes to succeeding generations.

Should we try to play God by interfering in the "natural" processes which shape our genetical future? For most of the scientists

present the answer was obvious: we are already engaged in such interference, and have been since the earliest days of medical science. The real question concerns the goals and the means to be employed in directing our future. One way or another, emphasized the Dobzhansky paper, tough decisions will have to be made.

> "Mankind is no longer free to choose to take on or to leave this awesome burden of direction of its evolution. It is inescapable, because we know something about evolution, and because this knowledge is rapidly increasing. Therefore, if we resolve to do nothing, to leave the knowledge unused, this will be a decision the consequences of which are predictable, and which carries a serious responsibility. One way or another, the problems will have to be faced."

What techniques are available — or are likely to be available in the foreseeable future — to help man pilot his genetic way ahead? Charles Birch listed the possibilities and suggested examples of the ethical questions they provoke.

Negative eugenics — the restriction of reproduction of persons with serious genetical diseases — is now more practicable than hitherto. It opens the door to the counselling of indidivuals who have a fair chance of producing defective children, or even the sterilization of carriers of seriously deleterious genes. The Australian scientist posed some of the issues which will have to be faced.

"1. When the chance that parents will produce a genetically defective child is exactly known, as can now be determined for a number of genetical diseases, should such parents proceed to have children? The chance will be one in four, for example, when both parents are carriers of a recessive gene for a particular disease.

2. How serious must the defect be before it is to be considered an unfair burden with which to encumber any human being, when such burden can be avoided by the decision not to have children?

3. For the good of mankind, should an informed section of the community make strong persuasive recommendations to people who carry known defective genes on whether children are advisable?"

Negative eugenics would reduce the amount of individual suffering in the world, but more drastic action is required if man's accumulating genetic burden is to be countered and his proportion of desirable genes increased. Techniques which might be employed come under the heading of *positive eugenics*. One such is the encouragement of production of progeny from sex cells of parents having a beneficial genetical constitution, along the lines of farm animal improvement programmes. Proposals have been made for "germinal choice", by which "sperm banks" and (later, perhaps) "ova banks" would make available sex cells from donors known to have been outstanding in a number of favoured respects. Alternatively — and, at this stage, more hypothetically — the technique of cloning may become applicable to human reproduction (cloning entails the implantation of body cells from a desired donor into the denucleated ova of any number of foster mothers, thereby providing offspring identical with the donor). Further questions from Birch :

"1. Germinal choice and other proposals for positive eugenics involves the complete separation of sexual activity and procreation. The separation of these functions is already to some extent given in the practice of contraception. Is there an ethical difference in 'going all the way' ?

2. A major objection raised by some geneticists to germinal choice is that what constitutes "desirable" characters for perpetuation is a matter of individual preference. Who knows what is desirable ? Furthermore, what is regarded as desirable may be genetically co-related with characteristics which may be undesirable. Muller lays stress on the choice being made by the prospective parents after being given all facts available. However, it is not difficult to envisage control moving to other quarters for racist or technological ("brave new world") reasons. Are the possible abuses of germinal choice so great as to render such a project abhorrent ?

3. If cloning becomes possible for man, he would have complete control over the genetical identity of offspring. What guidelines would be necessary for making appropriate choices ?"

Genetical engineering, still quite hypothetical as far as its application to humans is concerned, might offer yet another possibility

for positive eugenics and involves the direct manipulation of genes to change their genetical "information". Deleterious genes might be transformed, to annul their harmful effects — but equally the process might be applied destructively by the distortion of "normal" genes. This may still be in the realm of science fiction, but even at this stage we would do well to ponder some questions.

"1. Would 'genetical tailoring' be a 'violation of man'?

2. Since findings in genetical engineering might be used either for good or for ill, should research proceed regardless and for its own sake?"

How long can mankind tolerate its growing genetical burden? The more effectively science helps genetically defective people develop normally, the more widely their deleterious genes will be propagated and the heavier becomes the demand upon the community's medical services. "Some geneticists predict a genetical eschatology in which most people will be living on pills and spending a considerable part of their lives visiting clinics for treatment," said Birch. "Relaxation of natural selection certainly does increase the cost of medical services. Is any cost, no matter how large, acceptable?"

Shortcuts to Euphoria

Molecular biology, as well as opening up new developments in genetics, is also paving the way for a fuller understanding of brain function and a more direct control of human behaviour. According to Birch, four avenues of research are proving particularly productive in this area: the implantation of electrodes into the brain to control chosen functions or experiences, the use of drugs (e.g. tranquillizers and hallucigens), psychological conditioning (e.g. aversion therapy) and surgical sectioning (e.g. frontal lobotomy). Here again, what was science fiction has now become present reality, and society must grapple with the dilemmas which result.

"1. Electrical stimulation of the brain and drugs can evoke a variety of sensations pleasant and unpleasant, experiences

of euphoria and experiences of fear, great happiness and great dread. One group of workers have claimed by electrode stimulation to invoke a mental state which according to all descriptions and electroencephalogram recordings, parallels the mental state of Zen satori. This raises visions of 'plug in for your chosen experience'. Are there moral objections to short cuts to euphoria? Should such short cuts be freely available to whoever wants to have them?

2. In a society which may have the means of controlling individual behaviour by a variety of means, what safeguards would be necessary to prevent manipulation of a community and manipulation of individuals ?

3. To what extent is fear of consequences of a particular behaviour a legitimate means of inducing 'desired' behaviour? A case in point is aversion therapy for homosexuality and alcoholism. Punishment (by electric shock or emetics) induces a conditioned fear of undesired behaviour. What is the basis for making ethical judgements on the validity or otherwise of such treatments?"

"We Have Been Blind..."

Other panelists dwelt on other aspects of the human implications of biological discoveries.

Warwick E. Kerr, of the University of São Paulo, launched a vociferous attack on scientists for not being more concerned about the social uses to which their work is put. "We geneticists and biologists of the world can cry quite loud as the members of the Church of Laodicea: 'I am rich, and increased with goods, and have need of nothing' (Rev. 3 : 17a)," he said. "However, I believe we could also receive the reprimand : 'and knowest thou not that thou art wretched, and miserable, and poor, and blind...' (Rev. 3 : 17b)".

"We have been blind", went on the Brazilian biologist, citing the failure of his profession to involve itself in closing the gap between scientific knowledge and its use by the people for the sake of

the people. Everyone was horrified at Hitler's killing of six million Jews, yet by not challenging effectively the conditions which produce Brazil's high child mortality rate we bear responsibility for the deaths of an estimated eight million children in that country alone, since the end of World War II. War, terrorism, torture, dictatorship, lack of freedom, and violence against scientists, labourers, students, women and children — all these evils could be removed if scientists and others were prepared to fight against them with sufficient energy.

Following the example of the Incarnation, "the scientist who is a Christian must leave his ivory tower and mingle with his own people, trying to become part of it, in order to save it from ignorance, bad health, bad economic conditions and bad habits". Those who try to excuse their lack of social commitment with the argument that science should not get mixed up with politics, said Kerr, have in fact made a commitment to avoid change, avoid humanization, avoid love and all its consequences.

Is there a danger that, in this new debate, the essential dignity and worth of the individual before God will be played down? Norwegian biochemist Agnar Nygaard certainly thought so and warned against the temptation to treat a human being as merely one more piece of machinery which may be manipulated at will.

From a purely scientific point of view, he said, experimentation with human embryos and the abortion of defective embryos should be welcomed. The world has already more than enough people, man's burden of deleterious genes is increasing and there are obvious economic advantages (for the Scandinavian countries it has been estimated that the prevention of even 1% of defective births would trim $10 million from the annual budget for social care).

In Christian thought the work for a "perfect" brain and body can never be ultimate good. "I assume man to be unique and that God's care embraces the whole human life from the beginning to the end, the intellectual as well as the imbecile; also, the embryo is included", Nygaard stated.

French theologian André Dumas sharpened the point of disagreement. "What is the relation", he asked, "between respect for the sanctity of human life in itself, and responsibility for the quality of

human life before God"? Traditionally the Church has given absolute priority to respect for life itself — hence the arguments against abortion, birth control and genetic planning, and hence too the long tradition of Christian care for the physically and mentally handicapped notwithstanding the apparently deficient "quality" of their lives.

Clearly the traditional answers must be rethought in terms of the possibilities now being opened up by contemporary science. In this new context, the Church's age-old reflection on the dignity, quality and purpose of human existence has fresh relevance.

What are People for?

What is the essential nature of man? The question was often posed, and almost as often left unanswered, as participants struggled to come to terms with the promises and threats of the biological sciences. Japanese biologist Nobuaki Sawada spoke of organ transplants, mechanical substitutes for defective organs and mechanical tampering with the human brain and asked "is this technologically improved man a true man?"

The most knotty dilemmas in the fields of ecology, population control and genetics, said Birch, boil down to the fundamental question : what are people for? "If that is not a theological question I don't know what is", he added, urging the churches to help biologists transcend the narrow perspectives of their own discipline in a cooperative effort to develop a more valid image of man's nature.

> "In my experience as a biologist, we are the most conservative of all the scientists — the most mechanistically, most simplistically minded of the lot. . . . I start off with a bunch of students most of whom have a rather mystical view of human nature, but after four years of our teaching they are almost one hundred per cent simplistically mechanistic in their thinking, through the way we teach biology. This is the way in which biology has been successful — by taking the organism as a machine and teaching that it is a machine — but we end up with a concept of *homo sapiens* or a cat or a frog which is pretty remote from what these things

really are. We are miles away in our abstraction from the real situation of what *homo sapiens* is in relation to his total environment. We live in a very simple little world which we have discovered is an unreal world. This is why we are pleading... Is there a community which can help us become a little more real in our thinking? I would be the first to admit that we need to be educated. And as for the thought that the biologists control the future — heaven help us!"

If not the biologists, then *who* will control the future? The second working group addressed itself at some length to the need for new forms of decision-making, with the comment that "it may be that the major ethical issue raised by scientific advance concerns the mechanism of these decisions rather than their specific content".

"The new sorts of ethical judgements involved as a result of biological discoveries forces upon us the need to reconsider the relationship between (a) individual freedom to make decisions and (b) the need for society to make decisions which will limit the area within which individuals are free to decide. In fact society always limits individual freedom of choice; the question is whether we are to be, or can be, more self-conscious about this and plan the way society limits or permits the individual's freedom of choice. Thus, however shocking it is to our present ideas of human (individual) freedom, can we allow uncontrolled freedom of individual choice of individuals in such cases as family size, consumption of certain resources, sex of offspring and eugenic procedures? Christian ethics has traditionally been addressed to individuals making moral decisions (even if there is also an ethic of individuals who are members of a particular class, e.g. rulers, merchants, etc.). How do we work out an ethic which is appropriate to the shaping of society and institutions in such a way that human beings will survive and that individuals will have a chance to exercise appropriate freedom?

Modern biological research raises some of these issues sharply. New knowledge can create new ethical problems at both individual and social levels. For example, a pregnant woman who has the developing foetus identified as a mongol (down syndrome) may choose to have an abortion. This is her individual decision.

On the other hand, with some metabolic diseases (e.g. phenylketonuria) the child can be treated so that a more or less normal life follows including the capacity to reproduce. Such treatment involves an increase in the number of genes for these genetic diseases in the community. The overall increase over a long period of time may lead to serious problems for the communities in future generations, e.g. increased costs for medical services with increasing number of patients. Should social controls on individual freedom be applied in such cases? How can such decisions be justly made and what information is relevant to them? This is an area of serious ethical dilemma which should receive close attention. Particular scrutiny should be given to the concept of the human 'gene pool' and to the views of those biologists who put high value on the maintenance or improvement of the quality of the human gene pool."

Research is proliferating constantly, moving into new fields with a wide range of unforeseeable human consequences. Here too the decision-making process raises some vital questions.

"Biological possibilities of these kinds (whether they focus ethical decision on individual or social levels) only arise because of scientific research and research must be supported with social resources — manpower and money. In the past, decisions have been taken (possibly by default) to support the research. If research of this kind is to be supported in the future, further decisions must be taken in the light of competing research claims in other fields — since possibilities of research outstrip available resources. What is more, other social decisions are required to deploy resources to make techniques of this kind cheap and more widely available. The increasing scope of efficiency and power of science-based technology are making these foci of decision — the decisions of 'science policy' — the crucial areas for ethical concern. The structure quality of these decisions should be given careful attention. This is particularly true of the possibilities raised by 'positive eugenics'.

The World Council of Churches might encourage exposure and open discussion of these issues, and raise both the quality of public debate on the relevant ethics, and the public awareness

of the decision processes which are so crucial to man's future welfare."

These are not questions which the Church is asking of science, emphasized Birch. They are questions which science is putting to the world, inviting whoever might be able to help to join in the groping for answers. Most scientists would not naturally turn to the Church — for many it would be the last institution in which they would expect to find any enlightenment. "It would be a tremendous breakthrough if the World Council of Churches did in fact produce something that could be helpful and would meet the yearnings of biologists of this decade", he said. "I think it could be done...".

VI. The Context of Human Life - Industry and Urbanization

In the new demonology of the nineteen seventies, industry and city life rank high among what many see as the major threats to human wellbeing. Samuel Parmar, chairing a conference panel on the subject, reminded people at the outset that in many developing countries the picture looks quite different. "In many of our societies the process of urbanization is almost considered to be a process of liberation from some of the stifling conditions which exist in stagnant rural situations", he said.

Maybe the affluent parts of the world would be more appreciative of industry and urbanization, if they thought a little more about the positive contributions these phenomena had made to their own recent past. Pieter Kuin, for some years Director of Unilever (Holland) and now Visiting Professor at the Harvard School of Business Administration, offered his own family background as an example when opening the debate on "The Impact of Technology on Man and Society through Industry".

A Liberation Movement?

"My great grandfather was a small market gardener — a small peasant — who toiled sixteen hours a day and finally drowned himself because he couldn't make his little farm pay", said Kuin. One grandfather built a worthwhile life for himself and a future for his children only by abandoning his little market garden and becoming a small-scale cheese manufacturer. For both parents, moving to a city had meant higher income, less arduous work, better schools and in general a more pleasant life.

> "We have memories of primitive working conditions, draining the physical energy of both men and women. We remember the long, long depression with its great uncertainty, when many families fell by the wayside. We remember especially in my country (the Netherlands) the total disruption of production and

distribution of goods and services during the last period of the war and occupation. This has given us a tendency to appreciate the gifts of a better organized economy, a more abundant supply of goods and services, a more dignified way of living, a more joyful existence for families and a more abundant leisure in a more positive way. We have little time for those who are blasé with prosperity because their parents earned it and they take it for granted. They do not realize how precarious prosperity is."

Industry, according to Kuin, should be given most of the credit for the human emancipation which technology is making possible. "The consumer has never invented anything", he argued. "Everything we enjoy has been developed, produced and distributed on a large-scale by industry taking the chances of the market." Industrial management serves as the vital link between, on the one hand, research into the potential use of matter and, on the other, identification of society's needs and wants as expressed in private and public spending and legislation.

Battle might well have been joined right there. One does not have to be a disciple of Herbert Marcuse to entertain doubts about the responsiveness of industry to the real needs of society. Many would argue against Kuin that large-scale industry today, under pressure to create markets for its ever-expanding production lines, is distorting rather than fulfilling the technological needs of individuals and nations. Samuel Parmar offered an example from the Indian scene [1]. In the United States, it must bear part of the blame for the strong backlash which has now developed against the nation's military-industrial complex. The Soviet Union, Britain, France and the USA have all drifted into investing vast amounts of money and expertise in the development of supersonic transport aircraft — which at this stage looks like anything but a socially responsible use of technology.

The Dutch business leader went on to outline some of the ways in which the technology which industry fathered is helping to remodel its parent and patron. It presses for larger, more costly equipment which in turn requires production on a larger scale with

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[1] See pp. 71-72.

longer runs, greater standardization of equipment and more extensive distribution networks. Planning becomes more important than ever, with greater use of mechanical and electronic devices in production, administration and distribution. The lines of command and information are lengthened and new forms of work organization required.

All this affects people. It elevates reason as one of the greatest virtues, said Kuin, "because the autocratic, arbitrary and temperamental manager is unfit to be the leader of a modern technical organization of work". It calls for greater human flexibility and "obedience to the organisation". Changing equipment and methods require continuous adaptation and renewal in leadership and management techniques. For some it offers work which is stimulating ; for others it means boredom ; for all it constitutes a challenge to develop better technology and better ways of managing technology.

Raising the Quality

What tasks do we face as a result of the social impact of these trends in industry ?

As had been made clear in the debate on ecology, our patterns of consumption, work and leisure are all caught up in the need for a more responsible use and recycling of natural resources. Better new technology is required to eliminate the unwanted consequences of the old, and this will demand a considerable outlay in effort and money as well as government legislation to bind industry to ecologically sound policies.

More controversially, Kuin called for "larger dimensions" and an end to "provincialism" in national planning, in order to facilitate world-wide industrial production and trade. "As soon as it becomes an obstacle to world-wide planning and distribution, nationalism becomes a reactionary force", he declared. Others would argue that nationalism (in this sense) is the Third World's only hope of keeping a degree of economic freedom for itself in the face of the spreading tentacles of vast transnational corporations which — in terms of any hope for world economic justice — constitute the real forces of reaction. Not so, said Kuin, rejecting the assumption that profits and progress demand the exploitation of others.

"Progress in the standard of living in my own country has been many times faster after the Second World War, after we lost the domination of Indonesia, after the working classes had been emancipated and formed strong unions... The poor are not a condition for progress but an obstacle to progress. It is in the interest of all, including industry, to try to fight poverty as strongly and as quickly as possible."

Changing patterns of work and leisure are raising new questions, especially in the affluent nations but to some extent in their poorer neighbours as well. A working group identified some of the key problem areas.

"a) changes in work hours and schedules ;

b) new management styles and structures of participation ;

c) redundancy and forced retirement of the middle-aged ;

d) new employment opportunities for women outside the home, and for men within the home ;

e) continuing education and reeducation, searching for new forms of education to develop each man's specific gifts (including his aesthetic gifts) ;

f) changing relations between the generations ;

g) the investigation of new forms of civic service for both men and women (eventually to replace military service), to serve needy groups in the community."

Underlying the debate was a general conviction that somehow society must break from the old ideas which still shape its life and work, to find a fresh vision of more human styles of relationships between individuals, power groups and nations. These changes, said the working group, "should be not only technologically sound and economically feasible ; they must also reflect a heightened concern for human values and the quality of life".

"a) the development of a new ethos in the affluent countries, aimed at a simpler pattern of consumption ;

b) a shift from the excessive stress on private consumption and armaments in the affluent countries to expenditure for public measures to improve the quality of life and promote national and international social justice;

c) formulating ways of postponing or relinquishing consumption by elite groups in the developing countries."

For the rich nations it is primarily a matter of finding and asserting priorities other than that of economic growth for its own sake. Communities which for decades if not centuries have aimed at a constantly rising standard of living must now reorient themselves, to begin asking what constitutes a "reasonable" standard of living for all men and to explore more energetically the depths and potentialities of life itself. Perhaps, sharing in this process, the Church stands to resurrect long-forgotten dimensions of its historic faith. Christians may even be drawn to the conclusion that the fulness of a man's life consists not in the abundance of his possessions — and that, for wealthy nations of whatever ideology, would be subversive doctrine indeed!

The issue, to this observer at any rate, seems frequently to be mis-stated. The West's inherited values and goals were shaped in response to the grave shortage of essential material goods, goes the argument, and now that the problem of scarcity has been overcome westerners can cease their preoccupation with economic matters and set about establishing a new set of goals for themselves.

It speaks volumes for the provincialism of the rich nations that people can speak so glibly of an end to man's desperate struggle for survival — as if the poor nations did not exist or were no concern of theirs. The West certainly does need a new set of goals, but paramount among these must be commitment to global economic justice which will include the more effective transfer of technology and its benefits to industrially backward areas.

Technology Transfer

"All present attempts to transfer modern technology from one nation to another (or within one nation) have proved inadequate, unsatisfactory or even disastrous, leading to new forms of political,

technological and financial dependence", said the working group rather sweepingly. Alejandro Rofman, an economist who heads the Center for Urban and Regional Studies in Buenos Aires, drew on Latin America's experience to provide supporting evidence.

Most Latin American countries can point to a rapidly rising gross industrial product, yet the employment situation is steadily deteriorating as they have low or even declining rates of incorporating manpower into the industrial sector compounded by a constant increase of rural immigration into the urban centres. The statistics reflect a growing mass of human misery. Said Rofman :

> "The root causes lie in the structure of external dependence and internal domination which characterize the Latin American countries. Industrial investment fundamentally rests in the hands of big foreign firms which import the technology which they have invented and designed for the development of their own countries. This introduction of technology carried out straight away in countries where the increasing absorption of manpower into industry would call for processes which made a more intensive use of manpower than that of capital, disrupts the whole urban labour market. Yet this phenomenon takes place unhindered because within the various countries the internal power-structures permit, make possible and facilitate the process of importation of foreign capital and technology. Instead of making an effort to avoid the impact of this phenomenon, they in fact benefit by it. The effect of this process of industrial investment is that the old enclave formed by the Brazilian plantation, the Chilean mining company, or the banana firms of Costa Rica or Honduras, is now replaced by the big petroleum firm, the big steel works, the big oil refinery, which import their equipment, their technicians, and select a restricted group of highly specialized workers. All the profits they make are sent abroad, and this is encouraged by the exemption from taxes granted by the Latin American country in order to stimulate this process of investment. It is paradoxical to see how this supposed modernization to a large extent involves marked regression in regard to distribution of income, employment, internal repercussions on the industrial process and an increase in income for the foreigners working in what to them are peripheral countries."

What then is the solution? Imported industry must be adapted to the real needs of the recipient countries in terms of the way it relates technology to manpower, investment to other economic activities and the locating of its operations to existing population patterns. Underlying the whole problem, according to Rofman, is the paralyzing structure of internal domination and external dependence. Nevertheless the Argentinian economist managed to maintain a glimmer of optimism.

> "I think that the forces which for so many years inspired the processes of national and social liberation in many Latin American countries, if they are strong enough to act in the conviction that the support they need is going to be given in every practicable way, and if they have the certainty that their action is not going to be violently suppressed, may once again set in motion a great process, the second liberation of Latin America."

In response, the working group urged that priority be given to the intensive study of possible new forms of such transfer "which are not only transfers of technology but also transfers of power". Some approaches were proposed:

"a) methods of transfer of complete technological structures with all their components;

b) immediate and feasible partial transfers of the first processing of locally produced raw materials;

c) new methods of general and technical education on the spot (this is a field where the churches might pioneer as they did in earlier periods in liberal arts, education and in medical care);

d) the development and expansion of modern communication systems as part of the transfer of technology;

e) the provision of highly competent and charismatic personnel who have already proved their ability in their home country to build technological enterprises both in manufacturing and in agriculture.

In exploring other possibilities we must not limit our imagination to current technology, but must be ready to envisage the possibility of unimagined technological changes, and the possibility of large-scale enterprises mobilizing tremendous resources similar to those involved in space exploration.

As part of this study it is urgently necessary to search for new ways of promoting cooperation between positive forces and men of good-will, as well as for new structures of countervailing power which will be effective.

a) as between nations, particularly with reference to the role of foreign-owned industry, multi-national combines, foreign political intervention and multilateral institutions... (i) the strengthening of national political structures; (ii) new forms of regional groupings resistant to manipulation; (iii) new multilateral forms of providing capital management and resource use; (iv) supra-national agencies of control; (v) provision for a local capital base.

b) in the economically backward areas of affluent countries, particularly with reference to the role of central government agencies, multi-national companies and companies with absentee ownership... (i) increased central government responsibility; (ii) the strengthening of local bargaining power; (iii) legal control; (iv) provision of a local financial base."

The gravity of the situation requires more than study and technically feasible solutions. Without massive will-power and vision no improvement can come. Margaret Mead spoke with hope of the possibility of a creative fusion between technology's unprecedented power to serve mankind and the younger generation's commitment to a vision of justice and peace.

"When we spoke of the children of God before we spoke in idealism, in revelation and poetry. Now we speak of people we know, for whom we are responsible. Now we have the spurt that comes from the new generation of young people, born since

World War II into this new world, born with this new perception, who are asking the older people — and also by analogy often the older countries, the older industrialized countries — to use their power and leverage on behalf of the new vision that the younger have of a world which we can simplify for the highly industrialized countries and reinforce and supplement for the less industrialized countries. The goal is not uniformity but diversity — diversity within which no group of the children of God fall below what we would now regard as necessary and know is possible for all the people of this planet."

VII. New Slaves, New Masters? - Computers

As technological societies grow more and more complex, the tasks of coordination and planning become more important and more daunting than ever before. Detailed information on an incredibly wide range of topics needs to be stored and produced upon demand. Complicated calculations must be made with speed and accuracy. Different kinds of expertise have to be integrated and enabled to make their respective contributions to the solution of intricate social, technological and economic problems.

The computer has arrived on the scene at the precise moment when it seems most desperately needed. Man's sorely tried intellect can now be mechanically extended, thus to stand at least some chance of coping with the problems and possibilities of a technological society. Moreover, the age of the electronic brain has only just begun.

In Britain alone the computer industry predicts that within ten years its present size will have tripled and the nation will be spending something like £2,000 million a year on its products and the expertise needed to run them. Larger data banks and more elaborate programmes will have been developed and inter-related, and a wider range of users will have access to them. Education, law, medicine, industry, banking and credit systems — these are only a few of the fields whose futures will be transformed by the new tools computer pundits are making available.

A Simulation Exercise

Are computers unmitigated blessings for the world? Or are they servants with a built-in drive towards domination and tyranny? To evaluate the potentialities and limitations of these new electronic phenomena as instruments in social problem-solving, a conference working group participated in an experiment under the leadership of Austin C. Hoggatt, a computer expert from the Center for Research in Management Science of the University of California (Berkeley).

As participants plus intrigued onlookers clustered around the computer terminal acquired by the World Council of Churches for the duration of the exercise, Hoggatt explained the simulation model which he had built and programmed. "You are part of a service organization and you are responsible for the allocation of a budget to provide education and essential services to ROM, a small developing country", he informed them. Background information was provided on Rom's 1969 economic and social situation and participants were told they had a fixed annual budget to juggle between the conflicting demands of the country's agricultural, industrial, health and birth control programmes. One year at a time, the participants would determine their budget allocation, feed the figures to the computer and receive an immediate report on the socio-economic impact of their decision. The process would then be repeated for the following year.

The aim of the exercise was to render Rom viable in the years ahead and thus work the service organisation out of a job. This hope, in the event, turned out to be wildly optimistic : the mythical country did not succed in resolving its grimmest socio-economic difficulties during the ten-to-fifteen year period for which projections were made. In fact, at one point it was devastated by an unpredicted and unpredictable famine — one of the random natural variations which had been built into the model as they are encountered in real life.

How Useful ?

More important than the trials and tribulations of Rom was the question of the usefulness or otherwise of the technique itself as an aid to problem-solving. Some in the working group, initially, were very sceptical, perhaps because they had come expecting total immersion in serious debate and had mixed feelings about spending hours playing games with a machine. Some too began with doubts about the value of such simulation or objections to what they felt were weaknesses in the particular model being used.

Hoggatt first listed, then demonstrated, some of the advantages of computer simulation techniques.

"The advantages of simulation techniques are worth repeating here ; problems which require solution can be posed quickly and those attempting to solve them can make mistakes without actually affecting the lives of real people. Again, the solutions proposed over many years can be represented in a few hours and the results analysed immediately. Most important of all, perhaps, is the self-realization that comes in the would-be problem-solvers themselves. The simulation model will not only test the skills of those who try to tackle it, but, if properly constructed, will provide them with an insight into their own value-systems."

The working group concurred. Its report enthused about simulation as a method for regulating conjecture, although it began by warning of the method's greatest limitation : namely, that deficient models and/or data will inevitably produce defective results.

According to the working group, the experiment had shown the computer's potential as a cohesive force capable of assembling and integrating various kinds of expertise relevant to the solution of a particular problem. The machine also has catalytic value, stimulating the experts to question the model's assumptions and thus to refine it for higher levels of usefulness.

Up to now computers have been recruited to aid scientific research, business, industry, economic planning and military strategy. Participants in Hoggatt's experiment saw the machines' competence being developed further to tackle the kinds of social problems the exploratory conference had had on its agenda.

"The working group feels that their use could and should now be extended into social and cultural areas. Elements of problems in these areas which are less readily defined include cultural, ethical and behavioural fields. Whilst it is recognized that the extension of the work into these fields presents immense difficulties of codification and quantification, recent work in the computer sciences encourages us to believe that progress can be made. We are convinced that the manner in which the computer can be used as an extension of man's unaided intelligence places at his disposal an immensely powerful new tool with whose aid a better insight may be obtained into the consequences of existing

policies, institutions and behavioural patterns as well as the exploration of alternatives. Therefore, we believe that the WCC should take an active and positive role in this work."

Some conference participants — particularly those belonging to churches which are not blessed with the money and bureaucracy of the North American ecclesiastical scene — boggled a little at the next recommendation. "We take it as self-evident that computers should be used to the maximum appropriate extent in the routine administrative procedures of the churches", said the working group, listing organizational structures, more effective resource allocation and theological and scriptural research among the areas where these techniques might prove helpful. Further, it suggested, such techniques should be considered for integrating and evaluating diverse elements in the WCC's new five-year study programme dealing with technology and the future.

Those to whom this seemed a slightly starry-eyed overestimate of the wealth of most parts of the Church may have missed the rebuke implied for our ecclesiastical machinery as it is now structured. Seen through the eyes of efficiency experts, the organization of the Church's corporate life offers vast scope for improvement.

Controlling the Controllers

Computers may be great assets for coping with some kinds of social problems, but their advent has been accompanied by fresh ethical headaches for the community.

The vast amount of personal information which can and will be fed into these machines, the unknown number of anonymous individuals and organizations which may obtain access to them and the aura of infallibility associated with the system by virtue of its unprecedented efficiency all add up to a servant with distinctly threatening possibilities. American consumers' rights advocate Ralph Nader was recently reported as exhorting members of the US Association of Computing Machinery to begin infusing "human considerations and values" into their systems. Otherwise, he warned, a new kind of tyranny lies in store and "we're suddenly going to wake up and realize we're a nation of slaves".

Nader's forebodings were shared by many at the exploratory conference. J. Edward Carothers, one of the leaders of the United Methodist Church (USA), spoke of the enduring damnation capable of being inflicted on a person by any adverse personal information which might find its way into a data bank. "God may forgive and men may forget, but a computer can do neither", he said.

The working group urged the WCC to explore these dangers further. It highlighted some aspects of the problem :

"(i) the computer gives unprecedented capability to store, manipulate and reproduce information about individuals, organizations and states. Access to the information gives great opportunity for beneficial action but similar opportunity for malevolent action. The latter applies not only to the ruthless state or business organization but also to individuals who obtain access.

(ii) the converse danger exists of incorrect records, whether incorrect by accident or by sinister design, being used to the detriment of the individual.

(iii) when large-scale banks of personal data are created, who should have the right of access to them ?

(iv) should information collected for one purpose, for example by a Government department, necessarily be made available for other purposes ?"

Meanwhile a great deal can be done now to help ensure that Nader's machine-dominated doomsday does not come to pass. Robert P. Henderson, General Manager of the Honeywell Corporation's Electronic Data Processing Division, is one of those who have proposed steps which can be taken to counter the threat [1].

First, says Henderson, safeguards can be built into systems to limit those who are allowed to feed information to them, to defend particularly sensitive categories of information and to scrutinize the credentials of persons who seek access to the material. Unfortunately,

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[1] "Record-Keeping in the Space Age", *Dateline*, Vol. 15, No. 1 (October 1970).

the human ingenuity which can invent such security systems can also find ways of circumventing them. Legislation defining rights of privacy in the face of these new threats will be required. The human factor — the reliability and discretion of key operating personnel — is crucial. Most important of all is the development of informed public concern, to make people aware of what is happening to them and to keep under critical review the goals and practices of computer users.

Keeping the Values

The computer emerges as a mechanical slave, an amoral amplifier of human intelligence, enshrining and magnifying the ethical predilections of the people who order its work. Morally neutral technicians, argued Hoggatt, need careful watching.

> "There is one thing about a technician : if you ask him to work for you and you don't tell him what your values are, he will try to employ his own. If that technician loves machines, he may further their ends. If he loves men or is told that he must act as if he does, then he may further the ends of men. In that, he is amoral. His technique is available to the highest bidder. We have to buy our slaves carefully and make them do our bidding and impose our values, or the ethic of the machine and its contents will prevail. That ethic will be an unplanned consequence of all of the restrictions and binding functions which have been placed in that system, and its consequences will be unpredictable by us or even by the machine. We must, therefore, find a way to infuse our human values into this process.
>
> I see no alternative ways to think about our problem than this way because to leave our system fragmented and seek for uncoordinated results would be to court disaster. I hope that a cooperation may be entered into between the Church and science so that this combination of values (and you are the keepers of the values) and technique (we are the keepers of the technique) may be combined to tackle the crisis problem which confronts us — and that crisis problem is no less than the viability of mankind."

"It is an exciting prospect", the computer expert concluded. "What scientist could refuse that invitation ?"

VIII. Who Sets What Course? - Systems and Ideologies

What are the goals towards which technology should be directed so that it may liberate every person for a more fully human life, in a true relationship to his neighbour, to nature and to God? What form should the directing process take?

Most of the conference debate hinged on these questions — and rightly so. Technology's methods, its choice of fields to develop and the priorities it sets are all determined by the social and political choices made by groups of people which hold the reins of power. It is no accident, for example, that the USA and the USSR have given high priority to the development of military technology during the past twenty years, or that Europe and North America have opted for the growth of a sophisticated high-consumption economy.

In other words, said one of the working groups, "systems of technological rationality presuppose ideological choices about what is good for society, which usually reflect the interests of the powers that make these choices".

Ending the Stalemate

To the immense satisfaction of all who have had their fill of cold-war sloganeering, the technological revolution is rapidly subverting both sides of the world's inherited ideological struggle. Old issues to which capitalism and Marxism tried to address themselves have dwindled to relative insignificance ; new issues to which neither has ready answers have taken their place.

Samuel Parmar, speaking on "The Impact of Technological Change on Society : The Future of Political and Economic Systems and Ideologies", expressed his doubts about the usefulness of Marxist analyses for coping with contemporary problems.

> "In the debate between systems and ideologies, the Marxist side has emphasized the slogan 'Workers of the World Unite. You have nothing to lose but your chains'.

The problem is that today the workers have something to lose, and precisely because they have something to lose, they don't unite. You find in many societies, not merely the affluent, that the working class is tending to become more and more a conservative class. You find the progressive and radical forces (certainly in some Western societies) which emanate from students and intellectuals, are meeting with opposition from trade unions. You find that when one nation — a large power — aggresses against another nation — a small power — in the same ideological sphere, the workers do not unite. The workers of one nation support the policies of that nation : the workers of the other nation sympathize with the struggle against the aggressor.

Even the workers of poor countries like India and Pakistan or Malaysia and Indonesia, who have no material prosperity to hold them back, are chained by patriotism and national loyalty and are willing to support their respective governments in a conflict. They do not unite by thinking of themselves as a common proletariat.

Therefore, the whole ideological question has now many new nuances."

There are problems at the other end of the ideological spectrum as well. Nations which traditionally have put great store by free enterprise and individual liberties are discovering that rapid technological change demands increased governmental and intergovernmental initiative. Freewheeling capitalism at this point in history would be the perfect recipe for ecological disaster and for social chaos in general. The greater the threat of social disintegration, the stronger will be the pressure for political innovation and ideological rethinking. Many in the affluent West sense that their societies are caught up in a repetition of that process of drastic change in structures and self-understanding which marked the advent of the industrial revolution.

"Science has become society's legislature. This is the most general political implication of the scientific revolution. All our ideas about legislation and the ways we conduct our legislative institutions are based upon two assumptions : that men of common prudence and wisdom are capable of understanding even the

most perplexing issues that may arise in society, and that the deliberate determinations of representative institutions are adequate to control them. The scientific revolution discredits both of these assumptions. It faces us with the necessity of inventing new deliberative and legislative processes that will be as adequate to the issues of today as our traditional governmental institutions were to the kinds of issues characteristic of the times of their founding in the 18th and 19th centuries." [1]

What are these new issues which constitute a fresh framework for the debate on structures and ideologies?

"Intermediate Concepts"

Jeremy Bray, formerly Joint Parliamentary Secretary of Britain's Ministry of Technology, underlined the need for political thought to come to grips with the language and methods of technology. "Those who cling to arts of government, to concepts of government, which are suited to a past epoch become as much victims of technology as those who suppose that mere technocratic changes in the machinery of government can cope with the increasing tensions in society", he warned.

Thinking within the traditions of western democracies, the British mathematician-cum-politician offered three "intermediate concepts" to help bridge the gap between abstract models of the state and specific policy decisions.

The concept of *the open state* affirms that the workings of the state should be known to its citizenry. Free elections are not enough: structures (the government, the democratic assembly, the judiciary, local government) and decision-making processes (allocation of public expenditure, the setting of social objectives) must be subject to the scrutiny of those on whose behalf they operate. As social relationships become more complex so too does the role of the state within them, rendering such openness more necessary than ever.

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[1] Harvey WHEELER, *Democracy in a Revolutionary Era: The Political Order Today* (Santa Barbara: Centre for the Study of Democratic Institutions, 1970), p. 119.

Rather static ideas of welfare, equality and workers' rights should be replaced by the more dynamic concept of *the regenerative society*. Bray provided an example.

> "It's not enough to be equal in a rapidly changing world : the question is — "equal with what ?" In what sense is the daughter of a coal miner equal with her father when the last thing she wants to do is marry a pit man ? She wants to go and work in the city. She does not want to live in a mining village. She wants the pit closed down as quickly as possible and to get out of it. Her father wants the pit kept open. He wants to go on working with his mates and go along for a drink at the Miners Welfare and to have the annual gala in the Cathedral down the road. These two wishes are mutually incompatible. How do you describe equality here when you close the pit ? What rights has the miner got in terms of rates of pay, new employment ? How do these relate to the rights of his daughter and the kind of life style she wants ? We have to develop the concept of the regenerative society which recognizes that it is not perfect. At the same time, society in its present state as well as in its future development, is capable of realizing more fully the potential for good of each person.
>
> A regenerative society is a dynamic concept in a way in which welfare, equality and even brotherhood are not. It translates them into terms appropriate to a rapidly changing situation."

The *adaptive economy* concept presupposes that a society is open and provides sufficient flexibility in planning for a society to become effectively regenerative. It suggests ways of running an economy which are more sensitive to changing conditions and more decentralized than the "programmed economy" of communist theory, yet more able than "laissez faire" to respond to developing objectives under the stress of alterations taking place elsewhere in the social system.

For Bray, the revelation, myths, symbols and rites of the Christian tradition give added dimensions to such concepts.

"The open state affirms the central importance and personal character of truth", he said. "The regenerative society reflects the redemptive mission of Christ and his Church. The adaptive economy reflects the continuing work of God in creation."

For many, especially among the Third World participants, all this sounded too optimistic, too much like an attempt to tinker with machinery which desperately requires total rebuilding instead.

Julio Barreiro, a political scientist from Montevideo, intervened several times to register the pessimism of Latin Americans. "This week we have been like children admiring a toy for which they have no key", he said, "because the power centres controlling technology are all in the hands of others". Residents of the affluent nations may regard their machines as aids to better living standards, but many have-nots see them primarily as more sophisticated (therefore more threatening) weapons the rich will be able to wield for reinforcing existing power structures of exploitation and oppression.

"Technology is power", agreed Parmar, "and that power is never neutral". It serves as a carrier of those economic systems and ideologies within which it has been nurtured. For the poorer nations, too much of the present transfer of technology is a projection of the economic needs of the givers rather than a response to the needs of the receivers, the Indian economist contended.

> "In many of our big cities in India, even in some which are not so big, one comes across large billboards where a small Telefunken transistor is advertised : on the billboard you see a small, compact Telefunken transistor, flanked by an eye-catching blonde, young lady. Underneath is the caption 'Product of German Technology'. The transistor or the lady ? I think both.
>
> There are elements here which are very significant. We need transistors for mass-communication in India ; therefore we need the technology. But with that technology, a certain economic pattern or system insinuates itself into our situation. I mention some elements of this.
>
> The product is important — that is one thing which comes with the technology ; the other thing which comes with the technology is the symbol of the young lady as an expression of a burgeoning cosmetics industry in affluent societies.

The third thing which comes to us is a certain pattern of advertisement which may be relevant to market-oriented economies. We have to see whether it is relevant to our situation.

The fourth thing which comes to us is the expression of a high-consumption pattern, of which both the transistor and the style of advertisement are expressions. A high-consumption pattern is not part of our economic reality ; it may be a legitimate part of the economic reality of affluent societies. It is not for me to question the ethics of a high-consumption pattern. I leave that to those who are having that experience. But for our societies the present situation is one where the emphasis should be on savings rather than on consumption. Voluntary savings in our societies are not adequate, simply because the income of the people is low. Therefore we have to embark upon forced savings, to build infra-structure ; to build our agricultural capacity ; our industrial capacity. Once you accept this concept of forced savings, then you really have to put curbs upon consumption. Not so much curbs upon the consumption of those who are at the sub-consumption level, because their consumption has to be raised both on economic and on humanitarian-ethical grounds ; but you have to curb the consumption of those who are in the relatively high-income bracket. Many of the things which come with western technology are things which cater for the consumption of the high-consumption groups in our society."

By catering mainly for the secondary consumption of high-income groups rather than the primary consumption of the masses, producers tend to distort rather than advance the economic patterns needed for development. The inflow of technology is not simply the arrival of new tools and competencies. "It is an inflow of a particular economic pattern with all these ramifications : increasing inequality, increasing awareness of class distinctions." A necessary pre-condition for planning therefore is the building of those institutions which will allow a graduated entry of technology in terms of the social and economic realities of the recipient countries.

Parmar saw the old European-based struggle between Marxism and capitalism being eclipsed by the growing world-wide rift between the powerful and the powerless. "In our societies the major ideological reality is the reality of nationalism", he said, "because nationalism

is for us a part of the liberating process". Generally the developing countries experience nationalism as a constructive, outward-looking movement, but the extent to which it will continue to move outwards depends largely on the amount of authentic internationalism manifest in the world community. If the movement is to continue there must be radical restructuring of the relations which have prevailed up to now between powerful and less powerful nations.

> "In the past, during the period of colonial expansion we had, in many of our countries, modernized industrialized sectors, in the extractive and some other industries. These industrial sectors were set up not as an expression of our economic needs, but as a projection of the economic needs of the metropolitan country on to our economy. A whole theory of international trade was built up to show that whenever there is international trade both parties gain. We in the developing world were sufficiently indoctrinated to accept that theory. Till recently we made such a theory the basis of our trade and commercial policy naively assuming that whenever there is trade both parties gain.
>
> Where is the gain to both parties? If the pattern of specialization and division of labour is a projection of the economic interests of one group — how can both parties gain? Therefore what we had were small islands of development surrounded by backward agriculture. Therefore our economies were described as milch-cow economies.
>
> Even the development of transport and communication in many societies, which were a contribution of the colonial period, and the benefits of which we are still enjoying, were a mixed blessing. Because the intention behind that development was to consolidate the power of the metropolitan country, rather than stimulate our economies.
>
> This is history. Let us hope that that is all past, and that we are in a position where new relationships are being forged. But the question is being asked: is the present transfer of technology a projection of the economic realities of the givers, or a response to the real economic needs of the receivers of technology? Is the transfer of international investment and finance in line with the

economic needs and realities of the recipient country, or is it a projection of the economic realities of some other country? Is the whole pattern of foreign aid a projection of certain politico-economic concerns and interests of the donor nations, or is it a genuine, authentic response to the aspirations for economic development of the recipient nations leading to a new spirit of partnership and sharing?"

Internal structures as well as international relationships are being given closer scrutiny by many in the poorer countries, and as a result a new approach to development goals seems to be emerging. "So far we have all been obsessed with the idea of a high rate of growth. But if social justice is given pre-eminence we may have to shift our understanding of what development is." [1]

> "The mirage of catching up with the rich nations is not an expression of our economic realities. How does it matter whether we in India catch up with the USA or with Japan or with the Europeans? What is important for us is to perform constantly better than before... Until we have struggled and come to a pattern of social justice and economic equality within our own situation, we neither have the credentials nor perhaps the moral power to struggle for economic justice in the world-wide situation."

Even if charity does begin at home, this in no sense lets the rich nations off the hook. On the contrary, the struggle for justice and peace in the Third World is all too often being aborted by the interests and intrigues of the powerful countries. Parmar spoke of the fear and impotence of the powerless in the face of "the new ideology which cuts across the old ideological patterns and leads to greater collaboration between those who have and dispense technological power". The USA and the USSR have discovered that they can and must avoid military confrontation, but now "the big powers are trying to export their tensions to us" in the form of confrontations-by-proxy in Vietnam, the Indian subcontinent, the Middle East and Africa.

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[1] For an example of this rethinking of what is really involved in "development" see *Fetters of Injustice* (Geneva: WCC, 1970), the report of the Montreux Consultation on Ecumenical Assistance to Development Projects.

Thus technology seems to make possible the projection of power in such a way that the powerful come together, despite their ideological differences, to wreak havoc upon the powerless. This is the catalyst for the new ideological ferment and herein are the terms of reference for the debate which must now ensue.

Issues for the Churches

A working group on this subject proposed three foci for the study and action of the WCC.

"a) The examination of the ideological presuppositions and the interests served by the systems of technology in modern society so that we may be clear about the function they serve and the limits within which their rationality operates ;

b) The broadening of participation in meaningful decision-making where structures of technological power are concerned. All people whose lives are affected by the operation of technological power should have a say in its development and operation ;

c) A study of the different forms which technology should take in different societies in order that the needs and hopes of all people in those societies may be served. We realize that there is a tension between the desire of nations and cultures to assert their own self-identity effectively and the requirements of peace and development for the whole of mankind. This tension must be explored and made creative."

The Christian faith has a direct bearing on the debate, said the working group, calling on the Church through all its agencies to share in the reflection.

"a) *First*, the churches in any society are continually tempted to adapt themselves to the prevailing rationality of that society. Theology is always ideological as it expresses itself in a particular context. This is in one sense the virtue of theology. The word of God must become concrete in particular times and places. It is particularly dangerous however when a

theology which represents the interests and the power structure of one class or society claims universality and cuts off thereby the judging and transforming power of the word of God;

b) *Second*, Christianity has in fact produced certain ideas which have become the rationale for modern western-oriented technological development. Among these are man's calling to have dominion over the earth, the historical promise and blessing of God, the subject-object relation between God and His people and the exalted New Testament concept of stewardship. As expressed in modern industry and scientific technology, these have become secularized idols. In many cases the insights of non-Christian cultures into the character of human life are important in correcting them. For this reason it is doubly important to liberate the Christian message by sound biblical and theological work from its false bondage to a particular concept of technological domination and power;

c) *Third*, theology has a creative task, which, as response to the revelation of God, it is peculiarly qualified to do in a world where systems of technology become aware of their rational limits and ideologies clash with one another. We are not agreed on the degree to which theology should risk becoming ideological in order to show man the way toward more responsible use of technological power and liberation from oppressive structures of it. The relation of faith to ideology remains a question to be worked out in concrete situations. But we are agreed that the Church must continually seek ways of expressing both the incarnation of Christ in the struggles of this world and the transcendence of God over all our systems. In this context the Christian understanding of creation, nature, and the historical future must be continually rethought. There may be some value in a process of theological study devoted especially to these issues. But we propose them here primarily as a dimension of the basic inquiry outlined above."

The group could reach no unanimity on procedures the study should follow. Eventually it listed five possible alternatives, some

of which are complementary and others in sharp conflict with one another. They reflect the dissensus of conference participants as to what constitutes the crux of the structures/ideologies debate.

"a) Some members of our group believe that the World Council of Churches should concentrate on engaging responsible leaders in business and industry, in social administration, trade union organization, and politics at the local, national and supra-national levels in dialogue about the moral problems which they face in making responsible use of the power in their hands. Most people in developed countries, this group maintains, are engaged in the activities of a high-consumption economy employing advanced technology in industry, trade and social services. Most people in developing countries aspire toward such activities. These activities include good education, working in organizations of many sizes and of mixed skills, moving in mid-career from one skill to another, accepting multiple and ambiguous sources of authority and mobility in both working and family life. They ask that the Church engage effectively in conversation with responsible persons about the detailed decisions they have to make in such a world.

b) Others of our group find the present patterns of a consumer-oriented society in a highly technological economy to be more problematic. They point out that the effect of this social structure is a departure from meaningful and responsible participation in social decisions. These members propose that the reasons for this growth in apathy be explored and that patterns of broader participation in social decision-making be explored which would have the effect of reforming the present structures of technological power and making them more socielly responsible. The participation of workers at all levels in industry, the membership of representatives of consumer and public interests on boards of directors of major companies and the participation of minority groups in the structures of government were among the examples mentioned. This would increase the tensions within an industrial society and make technology in some ways less rational and less efficient.

But it would have the far greater value of distributing power and forcing technologists to make decisions in the light of the interests of broader masses of people.

c) Others in our group would approach the problem in the context of active opposition to the entire structure of technological power as it is now organized, and to the ideologies which uphold it. Technology from this point of view appears as an instrument of repression and exploitation. The mystique of the technocratic mentality which at the moment conceals the desire to maintain the status quo despite all its appeals for participation, must be dispelled. Ways must be studied by which technology can become an instrument of liberation and development in the context of an ideology of revolution and basic structural change. This ideology will seem to be irrational from the point of view of technocratic rationalism but this leap into the irrational may be essential in order to gain a new and more human perspective. In fact this break with prevailing standards of technical rationality is already happening among youth in all parts of the world. We need to study its implications for a new and counter-rational strategy for the use of technological power.

d) A fourth context for this problem is that of non-Western, particularly Asian society in which Christian civilization has not prepared the ground on which modern technology has developed. Some of these countries experience a profound cultural conflict between their traditional values and the habits of thought and life which the management and control of technological power require. Christian faith may be caught creatively in the middle of this conflict. Its biblical sources may help a non-Christian culture both to rediscover the human values it represents over against modern technological rationality and to come to grips constructively with the power and promise which technology brings to man. This will require however a profound rethinking of the Christian message, with the help of human values contributed by traditional Asian and African cultures.

e) Many of us believe that the most important single ideology which attempts to restructure technological power in a new and radical way is Marxism. In countries with a Marxist-socialist form of government, Christians are in daily contact with this ideology and its practical effects on society. The dialogue emerging from this encounter is central for Christian responsibility in building the future of man. Which are the common practical tasks and what are the fundamental differences between Marxism and Christian faith as both seek to direct technological power towards the service of man?"

IX. Faith for a New World

In opening the exploratory conference, Dr. Blake had expressed the hope that it might mark the end of a long and generally sterile conflict between science and religion and open the way to new means of working together in the interest of human welfare. But communication and understanding are prerequisites to collaboration, and it was clear during the Geneva meeting that theologians and scientists are still far from sharing a common language.

A wide range of theological traditions was represented in the panel which addressed itself to "Technology and the Future : Theological Issues for the Church". It was scheduled deliberately for the second last day, so that speakers had the opportunity to hear and reflect on questions raised — and on those which were not raised but perhaps ought to have been — by the technologists and planners.

Theologians Speak

"The Church is called upon to think about the effect of technical change on society, not only to give expression to its judgement on this question but also to collaborate actively in the positive development of technology and science for the future", affirmed Metropolitan Ilya Shioloshvili of the Georgian Orthodox Church (USSR). Technological invention and change is a gift from God and should thus be welcomed and supported in every way, although because of the people who shape it technology has a demonic potential as well. The Metropolitan went on to lament the loss of nerve of some Christians in the face of these challenges.

> "I have had the impression in various meetings with Christians — western scientists and even some theologians — that they now have only a rather small belief. They simply do not believe enough in the possibility of an active influence by the Church. ... I as an Orthodox theologian do not agree with such a view, for we would find great treasures which lie in the Church if only we took the trouble to discover them... the fault is ours."

How are these "treasures" to be unearthed? What theological models might help us to rediscover forgotten dimensions of the Church's tradition of faith, to illuminate our dilemmas in the midst of the technological revolution?

Wolf-Dieter Marsch, Professor of Social Ethics at the University of Münster, drew heavily on the thinking of Teilhard de Chardin, that remarkable French scientist-visionary-theologian. Man in biblical thinking is not a finished product but is himself drawn into the evolutionary world-process as it moves towards history's consummation, argued Marsch.

> "The inclusion of man as the being who creates and develops himself by his technology ceases to be a problem for religion only within the framework of Teilhard's 'creation in process of eschatological becoming'... The differences we are accustomed to see between 'communism' and 'democracy' had for him already seemed obsolete. He was even able to regard the manipulation of the human species by biological technology as a quite possible, and perhaps even necessary, transitional stage on the way to the 'Omega Point'. He was able to look far more objectively at a possible necessary manipulation of man (with a view to man's adaptation to changed environmental conditions) than other theologians who, seeing here (in birth control, artificial insemination and even in embryogenesis) a threat to man's 'nature', are for ever drawing up rules of prohibition which they have to cancel a few days later."

Theology should break itself of the habit of referring back to an original, self-evident "nature", contended the German theologian, since this "nature" has long ago become part of a "history" which man as God's co-worker is responsible for shaping with his technology. Our guidelines for action are not to be found somewhere in the past but rather in the future, as all man's hopes, fears and programmes are challenged by the fundamental question "Does what we do help God's creation forward?".

> "In other words: a) does it maintain that fundamental reverence for the existence given to the world and man, that non-omnipotence, that creatureliness, that sense of the finitude and limits of

human thought and action, joined at the same time with respect for the neighbour who, like God, cannot be represented in images? In other words: b) does it maintain that humanity of God which dawns upon us in the figure of Christ — critical of all man-made law, open to opportunities of love to the neighbour, ready to suffer and ready to turn about? In other words: c) does what we do lead to new forms of common life, like that which in the New Testament gathered the Jews and Gentiles together into one church — overcoming barriers, continuing the humanizing work of the kingdom of God?"

Two misunderstandings of the meaning of Christian hope continue to plague the churches. The first, said Marsch, is that type of eschatology which retreats into the private sphere or into the inner life of the Church, hoping to keep the individual or the pious in-group unscathed from all the threats, promises and uncertainties of technological change [1]. The second is that politically-committed eschatology which wants to assert a *particular* concept of the future as ultimate and binding on all. The Church can be helped to avoid these two traps if it develops a special sensitivity to the dialectic of success and failure, advance and regression, progress and criticism, which technological development entails. "It must think of itself as the 'pilgrim people of God', as being 'on the way', and always mindful of the constant criticism, the judgement, of God."

Divine judgement — and the possibility of a penitent, creative human response — now frequently confronts the Church wearing the garb of technology, Marsch concluded.

"The distortions, perversions and denials of what God regards as human are to be labelled as such, for we know Christ, in whom we perceive the humanity of God. Mankind has therefore become more inexcusable in his technological achievements. The pictures of the last judgement, as the religious imagination once envisaged it, the imaginative reflection of the 'final outcome' of man's actions — are being provided today in the laboratories and

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[1] For a rather whimsical restatement of this kind of apocalyptic pietism, in the context of the debate about technology and the future, see David Jenkins' article "The Case for Pessimism — Some Interim Thoughts Concerning the Humanum" in *Study Encounter*, Vol. VI, No. 3 (1970).

drawing offices, in the military planning headquarters and prison cells, in the operating theatres and government offices. What is new in this future which technology makes possible — and with it the challenge for Christian eschatology — perhaps lies simply in the fact that men *can* know what they are doing. To help them to know this should be regarded as one of the Church's most urgent tasks."

Indian theologian Raymondo Panikkar, a Roman Catholic, emphasized that theology enters the debate with no ready-made answers. Its role rather is to contribute a vision which is both holistic and, to a degree, distanced from the stresses, strains and biases of secular concerns. "It has often been said that theology is always in the clouds. Let theology be momentarily in the clouds, in order to gain perspective on the whole and descend like rain to fortify all things", he urged. "This is its dimension, the forgotten dimension."

"Nature is also history", said Panikkar, endorsing the point made by the previous speaker. "The relationship between technology and man is neither that of a dichotomy of two factors nor a monolithic block. It is a complex reality. Man, machine and nature form a living organism." The machine should not be seen as a kind of degraded human being — a mere robot — because it is also a "humanized" species of nature.

André Dumas, Professor of Philosophy and Ethics at the Protestant Theological Faculty in Paris, had reservations about the holistic vision of the world and the future advocated by Marsch and Panikkar. Scientists and theologians are operating on two different planes : the former speak in terms of causality, the latter seek to interpret the word of God.

This old tension between science and faith, between causal and revelatory understandings of the world, has not yet been resolved and it reappears for example when we speak of the future. "An assembly of futurologists is not automatically an assembly of men who hope", he pointed out.

How should the Church think of and shape its own contribution to the future ? "I do not believe the future is going to be very secular",

said Harvey Cox, to the considerable bafflement of those participants who recalled the opposite thesis he had put forward in *The Secular City* five years earlier.

> "We may even be in for a rather dramatic religious renaissance, both in western countries and certainly in some of the non-western countries. I see evidence among young people in the popularity of certain Hindu and Buddhist religious practices, in the fascination with primitive civilizations, and in the drug culture. They suggest an enormous return to certain kinds of non-rational and affective modes of thought and action and, in some instances, a massive return to some kind of religion. Professor Mills says a secular future is not necessarily bad. I would say that a religious future may not be necessarily good."

What does the neo-romantic, anti-technological streak in many of these movements imply for the Church's social role in general and its response to technology in particular? Maybe, suggested the Harvard theologian, we should quite deliberately aim at "irrelevance" and refuse to make the kinds of responses to technological dilemmas which the world expects of us.

> "Perhaps what we should do at certain points in history is to nurture a kind of quaint, strange and even erratic dimension, sometimes expressed as much through the grotesque or strange as through the relevant or concrete. That is not, I would hasten to add, the entire mission of the Church. But perhaps many of us in this room who have laboured hard on theology and social ethics have overlooked the fact that at times the Church can be so in step with its times that no-one notices it. To be a little out of step with one's time is to call some attention to the way in which the steps are moving."

Theology's days as queen of the sciences are over and it will be in no position to dictate to the societies of the future. "At that point we should stop and engage in a liturgical hallelujah!" Cox remarked. "In those societies where the Church has been able to dictate, it has generally made a mess of it." On the other hand theology must resist classification as merely one specialization among others and stand as a challenge to the assumption that all human knowledge can in fact be specialized.

The Church's new role in a new world will be discovered through "inventive local breakthroughs" of small groups. One such breakthrough advocated by Cox is a rediscovery of the monastic tradition ("really a varied and interesting divergent series of experiments in how people can live together creatively in community") to enable radical experimentation with, for example, "larger families, different kinds of sexual relationships and a simpler life style not as much influenced by the constant stimulation of consumer needs." The point would be to help build a world in which people were moved to develop an "erotic" (" — I mean playful and aesthetic") relationship to their fellows, their machines and nature itself.

Aesthetics and the arts suffered as the conference's second-class citizens. Yet not only were there clear aesthetic overtones to many of the points of debate (for example, the talk about "models", "quality of life", "city planning" and "human creativity"), but they also bear closely on the Church's attempts to give expression to its faith and social responsibility. Cox demonstrated this in orchestrating some of the conference worship and it was underscored by Theodore Gill, Dean of the Detroit Center for Christian Studies, in a note evaluating the conference.

> "Since Christian ethics is now understood best *not* as a juridical discipline but as an aesthetic discipline, dealing not in the old lawyers' laws and commandments but in an artist-like effort after appropriateness, balance, proportion, style ;
>
> And since theology stammers now as it relearns its forgotten language of the arts, as it comes to understand itself not as 'science' (!) or as historiography but as an aesthetic discipline, beginning with visions, poems, songs, legends, myths, given order by those great creative artists, the master theologians, and re-presented by living communities in a gallery church (the ecumenical church) ;
>
> Therefore, in the studies ensuing from this conference, let aesthetics have specific, appropriate place. Finally, 'Church and Society' may be *all* about art ! Not in our time, but sometime, if there is time. 1970 is not too soon to suggest, at least, that the possibility was noted."

Communication Gap

Perhaps some of the scientists had false expectations of the theologians, thinking they should produce, as if by magic, definitive solutions to some of the most bewildering issues of our time. Maybe the theologians reflected something of their discipline's present role-confusion and lack of clear direction. Possibly the problem was partly psychological, the theologians assuming that their scientific colleagues were ready to attack at the first hint of a renewal of theology's old know-it-all imperialism and thus being excessively cautious in their claims.

Whatever the reason, the panel sparked general frustration and uneasiness among participants, many of whom felt that the theological disciplines should have more illumination to contribute than had emerged in the course of the debate. The irony was that the scientists' new readiness to take seriously the affirmations of theology had appeared precisely when theologians seemed to have become extremely reluctant to make distinctive affirmations of their own.

There are some things that cannot be done easily, suggested Keith Bridston, and theology is most certainly one of them.

> "There seems to be an assumption prevailing here that theology is a rather simpler science than almost any other and that it can be immediately apprehended and clarified and transmitted. But I assure you that theology is also a part of the afflicted world, perhaps afflicted by the present change of conceptualization that science and technology are in part themselves suffering from and which they in part have created. . . . This may be disconcerting for some who are looking for simplistic answers and very clear ethical guidelines, but nevertheless it seems to me a healthy sign that theology is becoming perhaps increasingly aware of the transcendence of God over theology. . . . The task of the theologian, in part certainly though it is pre-eminently true here because of the rather sad history of theology in this respect, is to listen, to absorb, to try to reconstruct and to reform theology as a science in terms of contemporary models."

Following this line of thought, many agreed with Panikkar when he termed it "a very positive sign that we realize our failure to communicate here. It could not have been otherwise after such long separation and antagonism between science and theology."

The nub of the problem, however, is not the difficulty of interdisciplinary conversation between scientists and theologians but what this represents in terms of the intellectual, spiritual schizophrenia of the contemporary man of faith. To varying degrees and in different ways, "the scientist" and "the theologian" live in the minds of all Christians today whether or not the tension expresses itself in the sophisticated jargon of an ecumenical conference. The task of reflecting on the points of contact between these two different ways of looking at man and his world does not belong only to those individuals labelled theologians ; separately and together, it is the task of us all.

Probing the Tradition

One part of the task involves the search for more adequate theological models, or "windows on to reality", through which we may gain fresh insights into the phenomena which constitute theology's subject matter. It is high time for the World Council of Churches to provide an ecumenical drive towards the sustained, serious study of such issues in contemporary hermeneutics.

The other part of the task entails the identification and extrapolation of those elements in the Christian faith-tradition which might conceivably have some light to cast on the dilemmas of technology and the future. Walter Hollenweger, of the WCC's Division of World Mission and Evangelism, illustrated one among many ways of doing this when he led the conference through an experimental bible study. Participants were invited to respond to an updated version of the encounter between Philip and the Ethiopian (Acts 8 : 26-40).

(26) The Christian Medical Commission asked one of its members, Philip Lookout, to go to the Medical School of Columbia University. There you will find specialists on genetical research.

(27) So he set out and sitting in the cafeteria of the Medical Research Centre he saw an American medical doctor. He was studying the technicalities of genetical research but at the same time he wanted to know not only what could be done, but also what *should* be done for the future of mankind.

(28) While drinking his coffee he was reading Thornton Wilder's 'Heaven is my Destination'.

(29) And Philip Lookout sat down at the same table as the medical researcher and saw that he was reading Thornton Wilder.

(30) And he asked him : what is your opinion of this book ?

(31) And the researcher replied : I don't know what I should think about it.

(32) The book described a Christian business man, a fundamentalist, working hard to make his Christian convictions match his business practice :

> 'He was led like a sheep to be slaughtered ;
> And like a lamb that is dumb before the shearer,
> he did not open his mouth.
>
> (33) He has been humiliated and has no redress.
> Who will be able to speak of his posterity ?
> For his life is cut off and he is gone from the earth.'

(34) Now, said the researcher to Philip, 'Tell me please, who is the author speaking about here : himself or someone else ? Who is this man, torn between his Christian ideals and his professional methodology, between his conscience and what people expect him to do ?'

(35) Then Philip began. Starting from this passage, he told him the good news of Jesus.

(36) Talking together they saw a big Red Cross. And the researcher asked Philip : do you know, that the Red Cross was founded by a crazy Christian ? Against the specialists of his time he did the crazy thing, which turned out to be right. Do you think that the cross of the Christians can give us some guidance in our research for the future of man ?

(Verses 37 and 38 have to be interpreted by the participants. Is there today an exterior Christian sign, which clearly identifies a Christian ?)

(39) Then Philip said goodbye and left.

(40) While the researcher continued his work well content, Philip continued to ask questions and sometimes was able to help."

One likely focal point is the biblical vision of *human solidarity and mutual responsibility*, which has clear relevance to planning for the future use of technology and stands as a warning against any temptation to separate the problems of technology from the ongoing battle for social justice, racial liberation and world economic development. It challenges those experts who are content to think about the future simply as an extrapolation of the present. It judges the perennial human sin — now more dangerous and inexcusable than ever — of seeing our responsibility for the neighbour in terms which embrace less than the whole family of man.

What does the faith have to say about *the limits and potentialities of each person* ? The question is central to so much of this concern — whether it is the ecologists calling for a heightened "quality of life", the biologists asking "what are people for ?", the planners talking about "goals" or a song recently on the hit parades which looks at life and asks plaintively "Is That All There Is ?". As Princeton theologian Charles West pointed out, Christians can speak not about personhood as an abstract concept but about the-person-in-relationship.

"There is, in the humanity of Jesus Christ, a determination of human nature that undercuts every attempt to conceive of humanity in general or collective terms. Man is, in relation, for a time which has ultimate, eternal significance without ceasing to be time with a beginning and an end. No man can be defined either as an individual or as an instance of a species, race, nation or any other collectivity. It is his relations which give him life, form and direction.

At the same time it is his relations that limit him. This is something that most technological planners, following the humanism shared by liberals and revolutionaries alike, tend to forget. The limit on man's existence does not lie at the limits of his capacities which can be extended indefinitely by technological, and perhaps in the future by biogenetical means. The limit lies at the centre of his life where the other person confronts him at every turn and asks him to define who he is with relation to her, or she to him, if we are thinking in human terms. It is in this centre that every person has to do with God. This means a continual redefinition of the self in this relation — a dying to self if one likes, in order to find the form of creative interaction. Into this process the control and remoulding of the physical world may be drawn. There is no determinate limit to the amount of technology that can be useful here. But the focus of the whole society is basically distorted when the aim of development is taken to be the provision of an endless cafeteria of satisfactions for possible human wants and endless opportunities for self-expression. Culture grows not out of abstract freedom but out of the fabric of human relations where people offer themselves to each other and to God."

A person relates not only to other people but to the whole complex of animals and things — past, present and to come — which make up his universe. The faith calls men to *awe before the givenness of all* and joyful celebration of the grace which creates, sustains and redeems the whole process of which humanity is part. The ecological problem, seen in this context, is more than a challenge to the technicians to stem pollution and maintain ecological diversity. It is a call to the Church to rediscover its dynamic doctrine of creation

and to reappraise its oft-distorted understanding of man's calling to stewardship.

Christian faith affirms that through and beyond these relationships with people and things, men are called to respond to *the judgement, forgiveness, grace and promises of God.* With the difficulties presently involved in the use of "God language" and the contemporary hollowness of some of our traditional mythologies of divinity and transcendence, the Church must struggle to find new ways of pointing to the divine other, the transcendent mystery, which breathes life into the flux of nature and history, which has manifested itself normatively in the man Jesus Christ and which remains the judge, the hope, the enabler and the source of creativity for technological man.

APPENDIX A

LIST OF CONFERENCE PAPERS

The following documents were in the hands of participants in the Exploratory Conference and, excepting the two non-WCC publications listed, copies of most are still available from the World Council's Department on Church and Society. *Study Encounter* is a quarterly publication of the WCC. *Anticipation* is an occasional set of background notes circulated by the Department on Church and Society.

Edited versions of some conference speeches and plenary interventions have been included in *Anticipation* Nos. 3, 4 and 5 (1970).

Introductory

Welcome to the Exploratory Conference on Technology and the Future of Man and Society — Dr. Eugene Carson Blake (WCC)
Technology and the Cultural Revolution — Prof. Kinhide Mushakoji (Japan)
The Hopes of a Scientific Age — Dr. Ernst von Weizsäcker (Germany)
Anticipation, Nos. 1 and 2 (1970)
Study Encounter, Vol. VI, No. 2 (1970)

Ecology and Population

Ecological Prospects : The Challenge to a Responsible Use of Natural Resources — Prof. John N. Black (Great Britain)
Demographic Prospects for Tropical Africa for the Next Thirty Years — Mr. Samuel K. Gaisie (Ghana)
The Increase in Population in Latin America : Social, Economic and Ethical Implications — Prof. Rodrigo Gutiérrez (Costa Rica)
Pollution, Politics and the Technological Order — Prof. Fred H. Knelman (Canada)
The Future of Man and Society in a World of Science-Based Technology — Dr. Phineas Makhurane (Zambia)
Prospects for Rapid Population Growth and the Economic and Social Arguments for Population Control — Prof. Theodore K. Ruprecht (USA)

The Churches and Population Issues — Katharine Temple (USA)
Population Policies in India — Dr. Savitri Thapar (India)
Man and His Living Environment (Westminster : Church Information Office, 1970)

Biology

Human Implications of the Discoveries in the Biological Sciences — Prof. L. Charles Birch (Australia)
Human Evolution and Ethical Issues — Prof. Theodosius Dobzhansky (USA)
Biological Science and Ethics — Prof. Warwick E. Kerr (Brazil)
Eugenics and Human Dignity — Prof. Agnar P. Nygaard (Norway)

Industry, Urbanization, Systems and Ideologies

Changes in Political Structures and Ideologies Indicated by Environmental and Technological Change — Dr. Jeremy W. Bray (Great Britain)
The Impact of Technology on Industry — Prof. Pieter Kuin (Netherlands)
Impact of Technology on Society : The Future of Systems and Ideologies — Prof. Samuel L. Parmar (India)
Industrial Development, Urban Employment and Technology in Latin America — Dr. Alejandro B. Rofman (Argentina)

Computer

Notes on the Presumed Inadequacy of Free Market Systems : Ecology and All That — Prof. Austin C. Hoggatt (USA)
On Men and Machines — Prof. Austin C. Hoggatt (USA)
Potentiality of the Computer in Solving Social Problems — Prof. Austin C. Hoggatt (USA)
Rules for the Play of an Economic Assistance Game — Prof. Austin C. Hoggatt (USA)
Simulation Games for the Social Studies Classroom — New Dimensions Series No. 1, published by The Foreign Policy Association, New York

Theological Issues

Technology and the Future's Theological Questions for the Churches — Prof. Wolf-Dieter Marsch (Germany)
The Future — The Standpoint of Christian Theology — Prof. Wolf-Dieter Marsch (Germany)
The Mirage of the Future — Prof. Raymondo Panikkar (India)
Ecological Commitment as Theological Responsibility — Dr. Joseph Sittler (USA)
Theology and Technological Change — Prof. Charles C. West (USA)

Working Group Reports

I. Ecology and Population
II. Human Implications of Discoveries in the Biological Sciences
III. The Future of Industry and Urban Life
IV. Systems and Ideologies in a World Perspective
V. Anticipating the Future : Simulation — A Method for Regulating Conjecture

APPENDIX B

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Miss Joan Sheard
Miss Christa Stalschus

Staff for Working Groups:

Mlle Madeleine Barot, Commission on the Churches' Participation in Development

Canon Burgess Carr, Commission of the Churches on International Affairs
Dr. Richard Fagley, Commission of the Churches on International Affairs, New York Office
Dr. Walter Hollenweger, Division of World Mission and Evangelism
Mr. C. I. Itty, Commission on the Churches' Participation in Development
Canon David Jenkins, Humanum Studies
Mr. Charles P. Lutz, New York Office
Rev. Steven Mackie, Department on Studies in Mission and Evangelism
Mr. Sang Jung Park, Division of World Mission and Evangelism
Dr. Konrad Raiser, Commission on Faith and Order
Mr. Martin Vereb, Conference Co-opted Staff

The working group on "Human Implications of Discoveries in the Biological Sciences", under the leadership of biologists Charles Birch (Australia) and Warwick Kerr (Brazil).

Austin C. Hoggatt, of the University of California (Berkeley), uses a computer to illustrate how simulation techniques may help solve social problems.

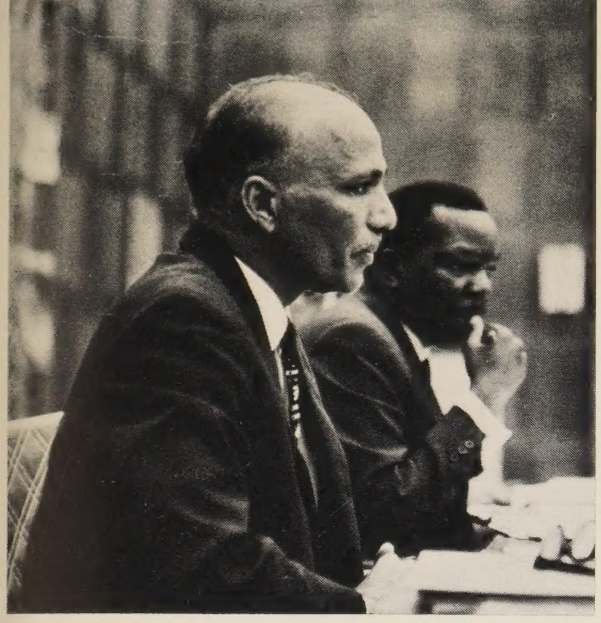
Conference Chairman Samuel Parmar of India's Allahabad University speaks on "The Future of Political and Economic Systems and Ideologies". With him is Phineas Makhurane, a physicist from the University of Zambia.

Charles West of Princeton introduces debate on "Technology and the Future: Theological Issues for the Church". Panelists are (from left): Metropolitan Ilya Shioloshvili (USSR), Raymondo Panikkar (India), West, Wolf-Dieter Marsch (Germany), André Dumas (France) and Harvey Cox (USA).

The Conference included over one hundred scientists, technologists, planners and theologians, meeting for five days at the Ecumenical Centre, Geneva.

Paul Abrecht (left), Executive Secretary of the WCC Department on Church and Society, with German industrialist Dietrich Wilhelm von Menges, Nigerian physicist Benjamin Nwosu and US anthropologist Margaret Mead.

Maurice Strong (centre), Secretary-General designate of the UN Conference on the Human Environment, discusses common concerns with WCC General Secretary Eugene C. Blake (right) and Joseph Gremillion of the Vatican's Pontifical Commission Justice and Peace.



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"The crisis we are facing has two aspects. One is the aspect that has developed directly from the speed of technological invention in the last century and the other aspect, an ethical crisis, stems from it. However much man has believed in the brotherhood of man, this is the first time in human history he has had to meet all his brothers."

Margaret Mead

"The ultimate question now is what system of human values, of goals, of priorities, of choices, of political and economic structures must we create in order to survive — because that is what is involved."

Fred H. Knelman

"It would be a tremendous breakthrough if the World Council of Churches did in fact produce something that could be helpful and would meet the yearnings of biologists of this decade. I think it could be done..."

L. Charles Birch

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